

PROVO RIVER DELTA RESTORATION PROJECT

Draft Environmental Impact Statement

Volume II: Appendices



February 2014

UTAH RECLAMATION
MITIGATION
AND CONSERVATION
COMMISSION



Dear Reader,

February 28, 2014

Attached for your review and comment is the Draft Environmental Impact Statement (Draft EIS) for the Provo River Delta Restoration Project (PRDRP). The proposed project would restore a naturally functioning river-lake interface essential for recruitment of June sucker (*Chasmistes liorus*), an endangered fish species that exists naturally only in Utah Lake and tributaries. In addition to fulfilling environmental commitments associated with water development projects in Utah and contributing to recovery of an endangered species, the project is intended to help improve water quality on the lower Provo River and to provide enhancements for public recreation in Utah County. Alternative B has been identified as the preferred alternative because it would minimize the amount of private lands that would need to be acquired for the project while still providing adequate space for a naturally functioning river delta and sufficient habitat enhancement for achieving the need for the project.

The agencies preparing the Draft EIS are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Central Utah Water Conservancy District, and the Central Utah Project Completion Act (CUPCA) Office of the U.S. Department of the Interior, collectively referred to as the Joint Lead Agencies. The PRDRP Draft EIS was filed with the U.S. Environmental Protection Agency for announcement in the *Federal Register* on February 28, 2014. The Draft EIS will be available for public comment until May 7, 2014 (a period of 60 days).

Your timely comments on the Draft EIS will help inform future decisions regarding which alternative to implement, if any. Comments are most useful that provide the Joint Lead Agencies feedback concerning the adequacy and accuracy of the proposed alternatives, the analysis of anticipated environmental impacts, or any new information that would help the Joint Lead Agencies evaluate the alternatives. Your comments should be as specific as possible and include suggested changes, sources, methodologies and references to a section or page number. Comments containing only opinion or preferences will be considered and included as part of the decision-making process; however, they will not receive a formal response.

The Draft EIS can be viewed or downloaded from the project website www.ProvoRiverDelta.us or by requesting a copy on CD. Paper copies are available for public review at the Provo City Library, Salt Lake City Main Public Library or any of the Joint Lead Agency offices. Comments may be submitted no later than May 7, 2014 by email to: rmingo@usbr.gov or by mail to: Mr. Richard Mingo, 230 South 500 East #230, Salt Lake City Utah, 84102.

On behalf of the Joint Lead Agencies, I thank you for your interest in the project.

Sincerely,



Michael C. Weland
Executive Director
Utah Reclamation Mitigation and Conservation Commission

PROVO RIVER DELTA RESTORATION PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT

Utah Reclamation Mitigation and Conservation Commission

**U.S. Department of the Interior –
Central Utah Project Completion Act Office**

Central Utah Water Conservancy District

A blue ink signature of Michael C. Weland, written in a cursive style, positioned above a horizontal line.

**Michael C. Weland, Executive Director
Utah Reclamation Mitigation and Conservation Commission**

A blue ink signature of Reed R. Murray, written in a cursive style, positioned above a horizontal line.

**Reed R. Murray, CUPCA Program Director
U.S. Department of the Interior**

A blue ink signature of Gene Shawcroft, written in a cursive style, positioned above a horizontal line.

**Gene Shawcroft, Deputy General Manager
Central Utah Water Conservancy District**

February, 2014

Cover Sheet
Provo River Delta Restoration Project
Draft Environmental Impact Statement

Joint Lead Agencies

Utah Reclamation Mitigation and Conservation Commission

U.S. Department of the Interior - Central Utah Project Completion
Act Office

Central Utah Water Conservancy District

Cooperating Agencies

U.S. Fish and Wildlife Service

U.S. Army Corps of Engineers

U.S. Bureau of Reclamation

Federal Aviation Administration

State of Utah

Provo City

Utah County

Contact

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Utah Reclamation Mitigation and Conservation Commission

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(801) 524-3146 rmingo@usbr.gov

Abstract

This Draft Environmental Impact Statement (Draft EIS) is being prepared pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969 (NEPA), as amended, the Council on Environmental Quality Regulations at 40 CFR 1502.25, and environmental review requirements under the Endangered Species Act (16 USC 1531 et seq.), the National Historic Preservation Act (16 USC 470 et seq.), and Section 404 of the Clean Water Act (33 USC 1344 et seq.). This Draft EIS will be available for public comment for a period of 60 days. It is intended to satisfy disclosure requirements of NEPA and will serve as the compliance document for Clean Water Act Section 404, Section 7 of the Endangered Species Act, Fish and Wildlife Coordination Act, and contracts, agreements and permits that would be required for construction and operation of the Provo River Delta Restoration Project.

The Provo River Delta Restoration Project is needed to facilitate recovery of June sucker (*Chasmistes liorus*) in Utah Lake by restoring habitat conditions essential for spawning, hatching, larval transport, rearing, and recruitment. June sucker occur naturally only in Utah Lake and its tributaries and is listed as endangered under the Endangered Species Act (16 USC 1531 et seq.). Three action alternatives are being considered, any of which would restore a more natural river/lake interface of the lower Provo River and Utah Lake and reestablish essential rearing habitat for June sucker. This rearing habitat would support juvenile June sucker until they are capable of surviving in the larger open water environment of Utah Lake. Under any of the three action alternatives, the lower Provo River channel would be split so that the main flow would be directed into a restored river delta area, promoting the development of a diverse, vegetated aquatic environment capable of supporting young-of-year and juvenile June sucker and other aquatic life. This natural area would also provide a variety of public recreation opportunities.

A portion of the river's flow would always be directed into the existing lower Provo River channel, which would be retained in place under any action alternative in order to continue to support existing recreational uses and aesthetic values of the existing river corridor. Two options are being considered for the existing Provo River channel. Under Option 1, the existing river channel would remain open to Utah Lake, allowing for fluctuating water levels at various times of the year. Under Option 2, a small dam would be constructed at the downstream end of the channel near Utah Lake State Park. This dam would maintain the water level in the existing channel at a relatively constant elevation year round. Under both options, a minimum flow of 10 cubic feet per second (cfs) and up to 50 cfs would be supplied to the existing channel. Additionally, an aeration system would be constructed in the existing channel to improve water quality and to better support aquatic life and aesthetics, particularly during the hot summer months.

Date Draft EIS Made Available to the EPA and the Public: February 28, 2014

PROVO RIVER DELTA RESTORATION PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT

Appendix A: Large Size Figures and Maps



Figure A-1

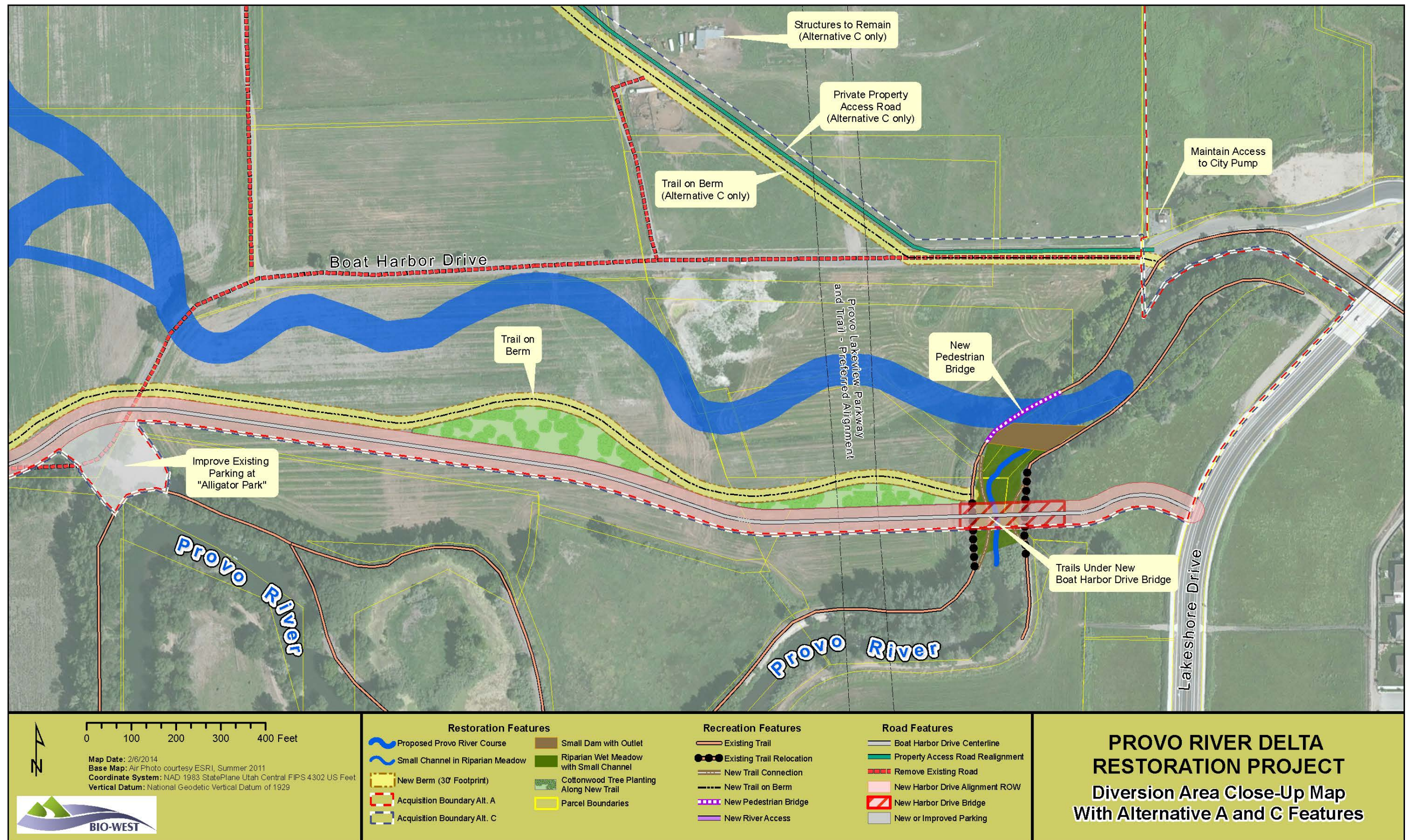


Figure A-2



Figure A-3

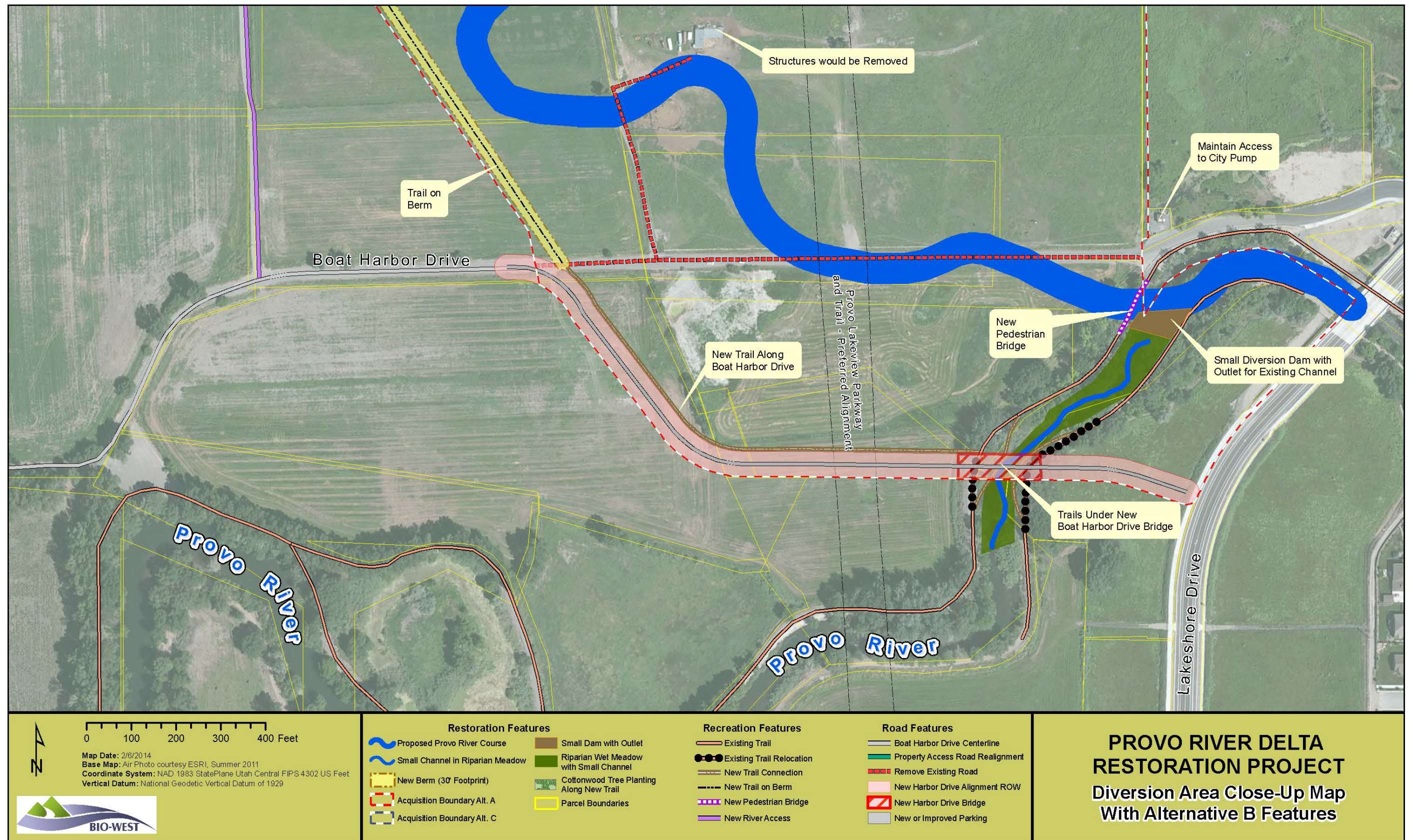


Figure A-4



Figure A-5

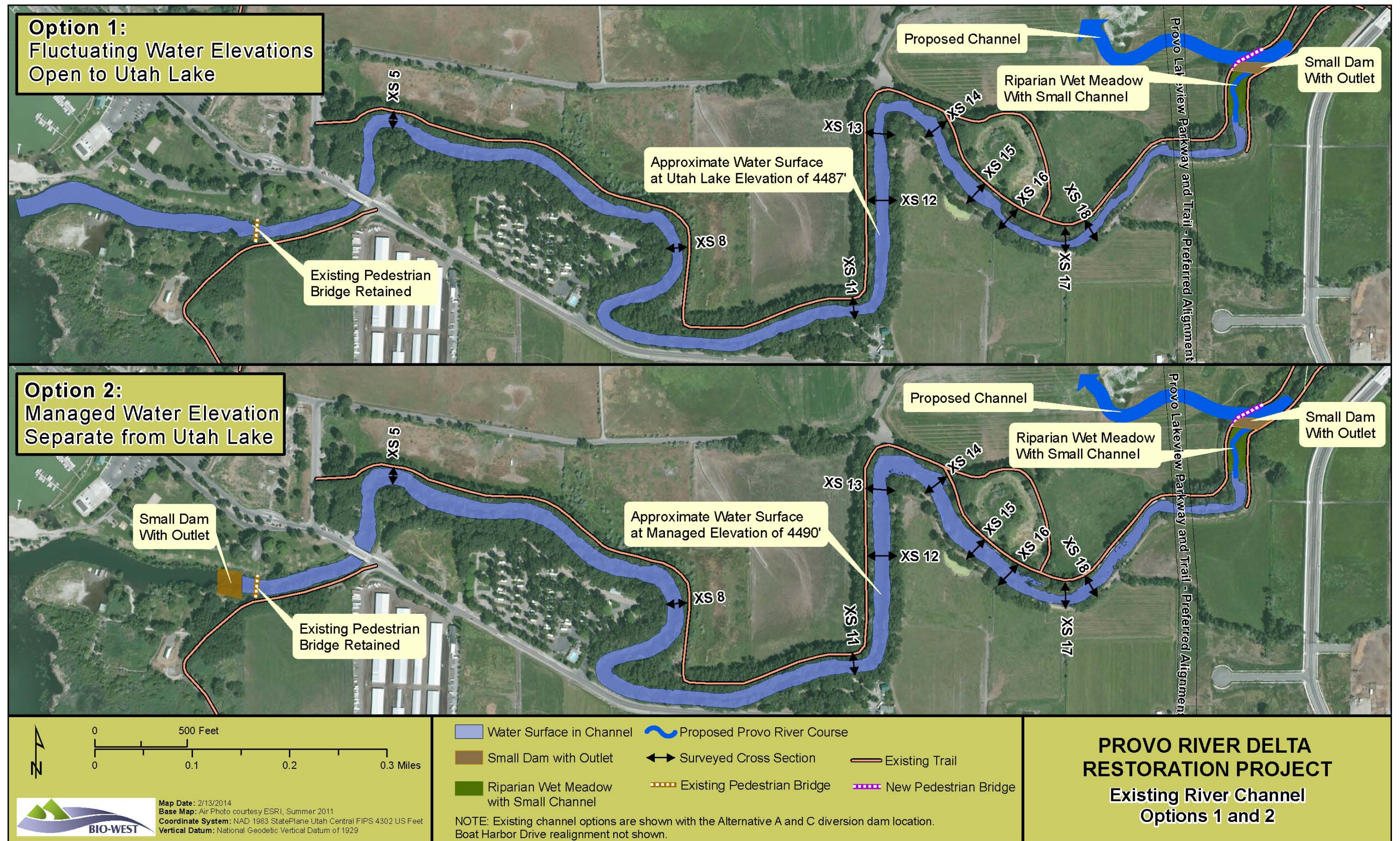


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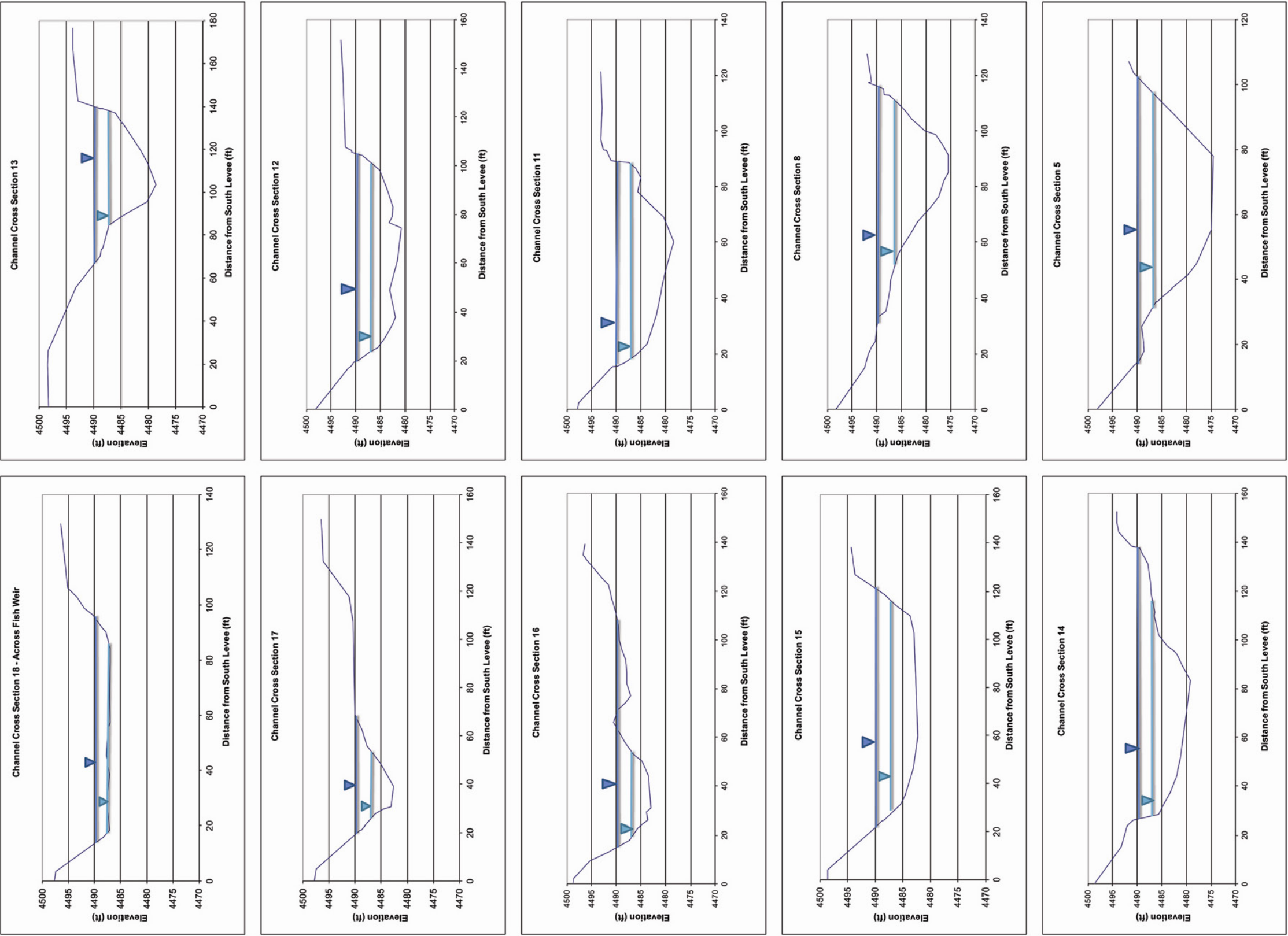
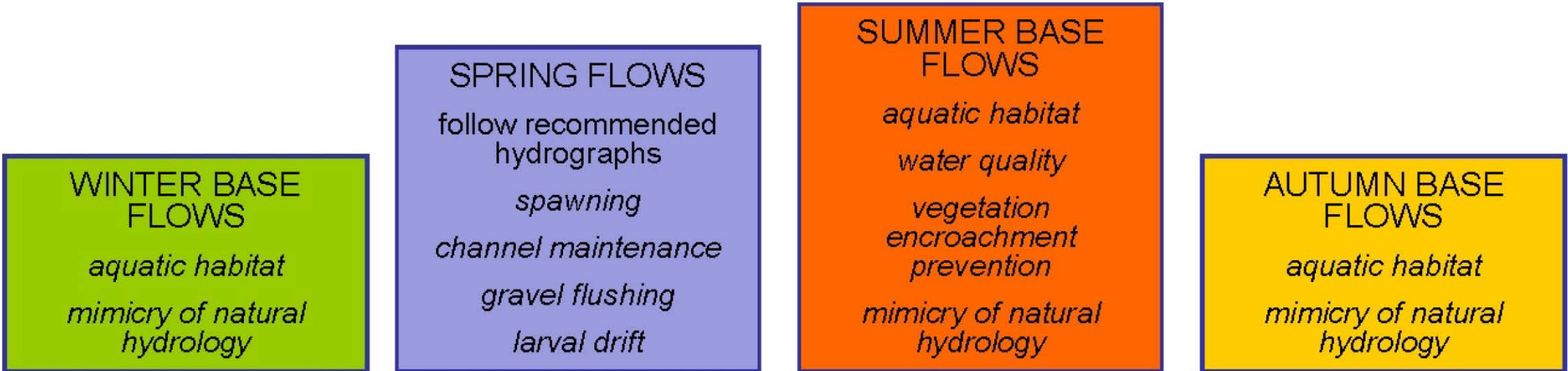
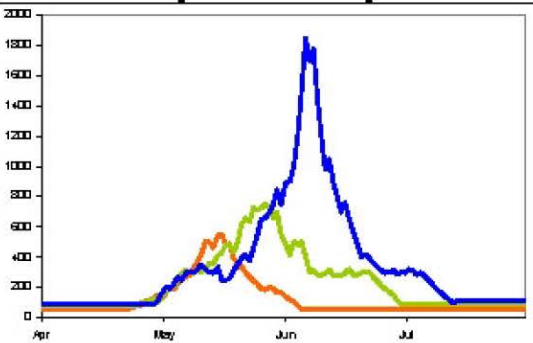


Figure A-7 Cross section views at 10 locations in the portion of Lower Provo River influenced by Utah Lake. These graphs show the water surface width when Utah Lake is at 4487' (Option 1) and 4490' (Option 2). The water surface is on average 20' wider at 4487' (Option2) compared to 4487' (Option 1), a 41% difference.

Lower Provo River Base Flow Guidelines



provide year-to-year variability	DRY YEAR		59 cfs						57 cfs			67 cfs		
	MODERATE YEAR		78 cfs						86 cfs			86 cfs		
	WET YEAR		83 cfs						113 cfs			100 cfs		
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	

provide seasonal variability

Figure A-8

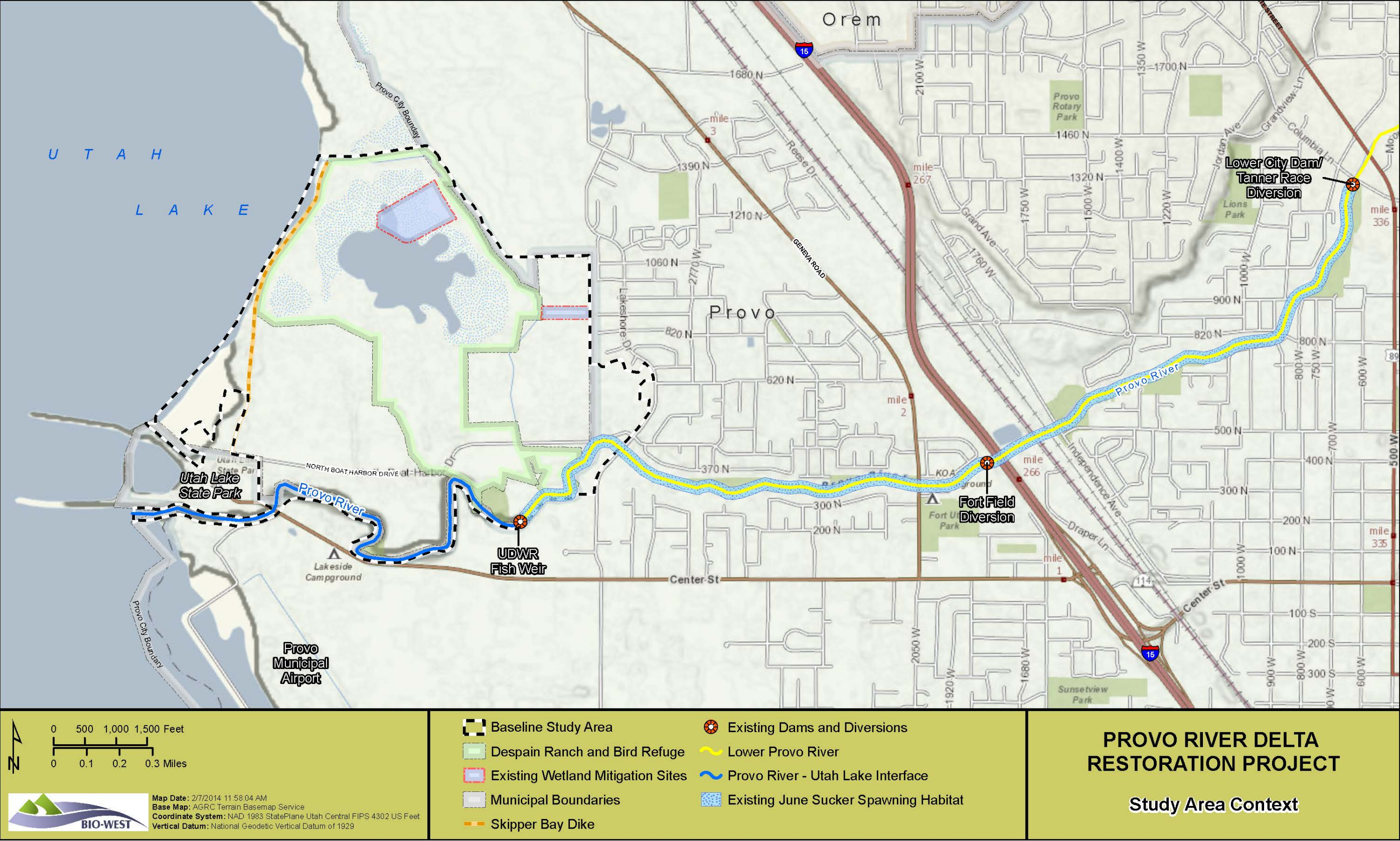


Figure A-9

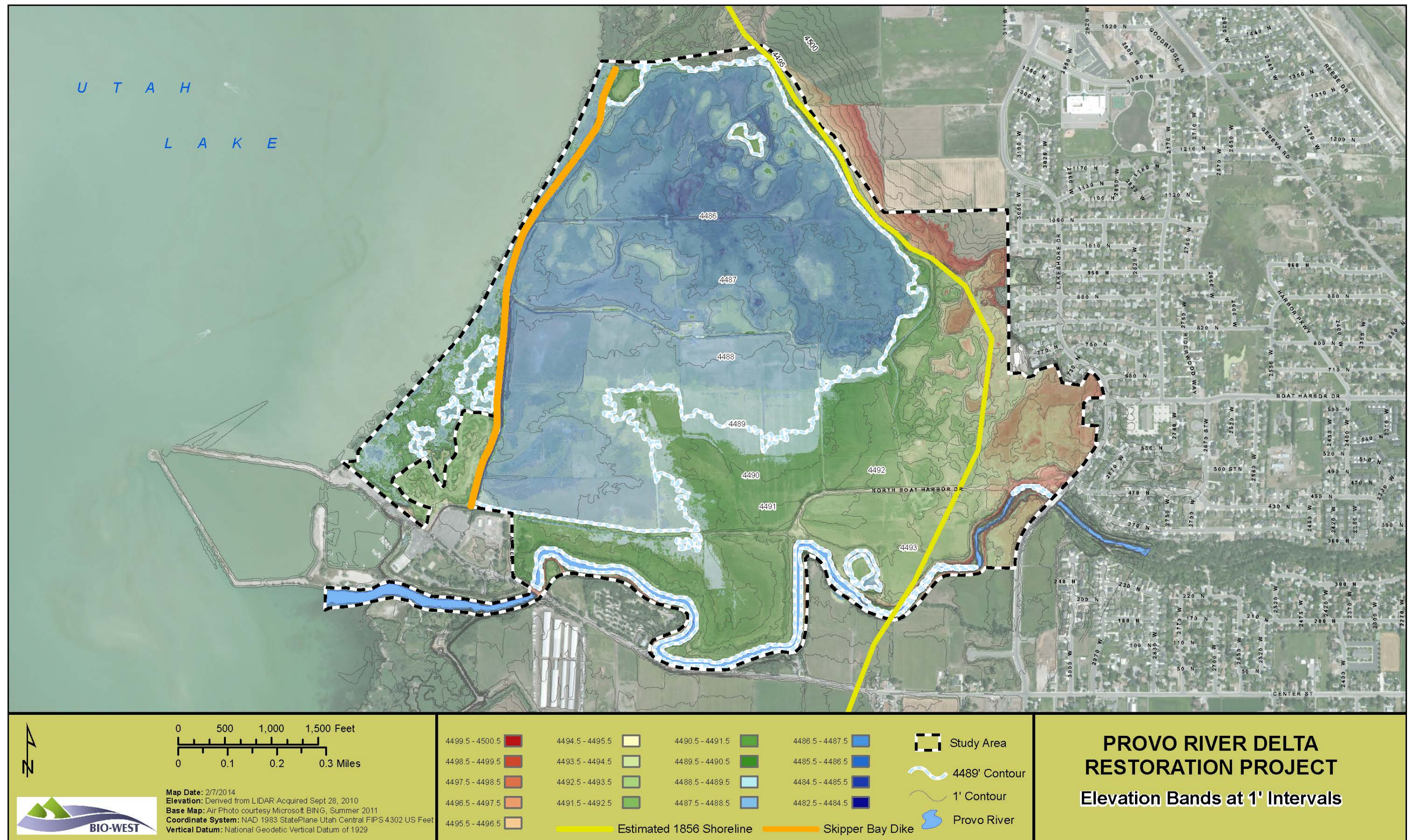


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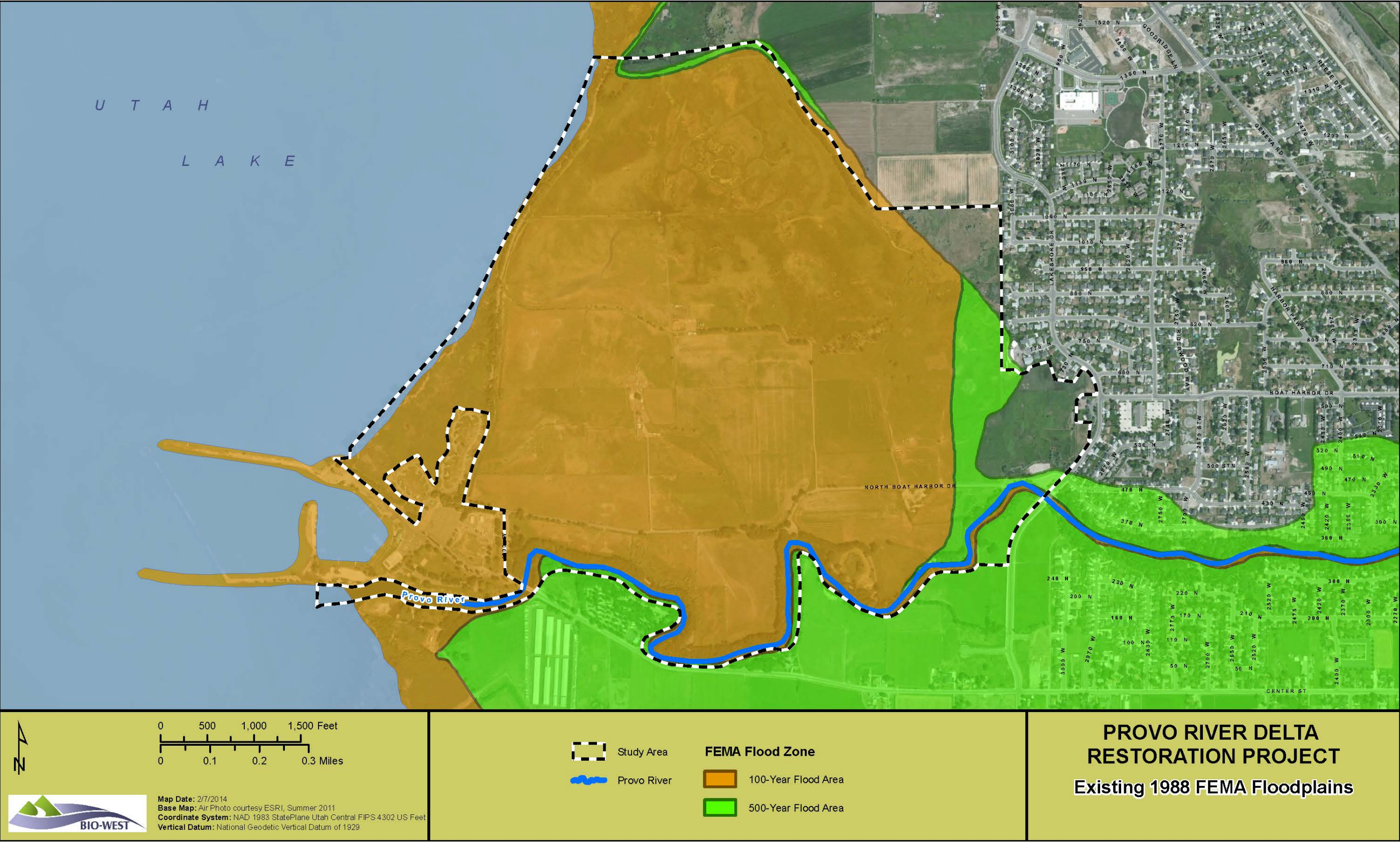


Figure A-11



Figure A-12

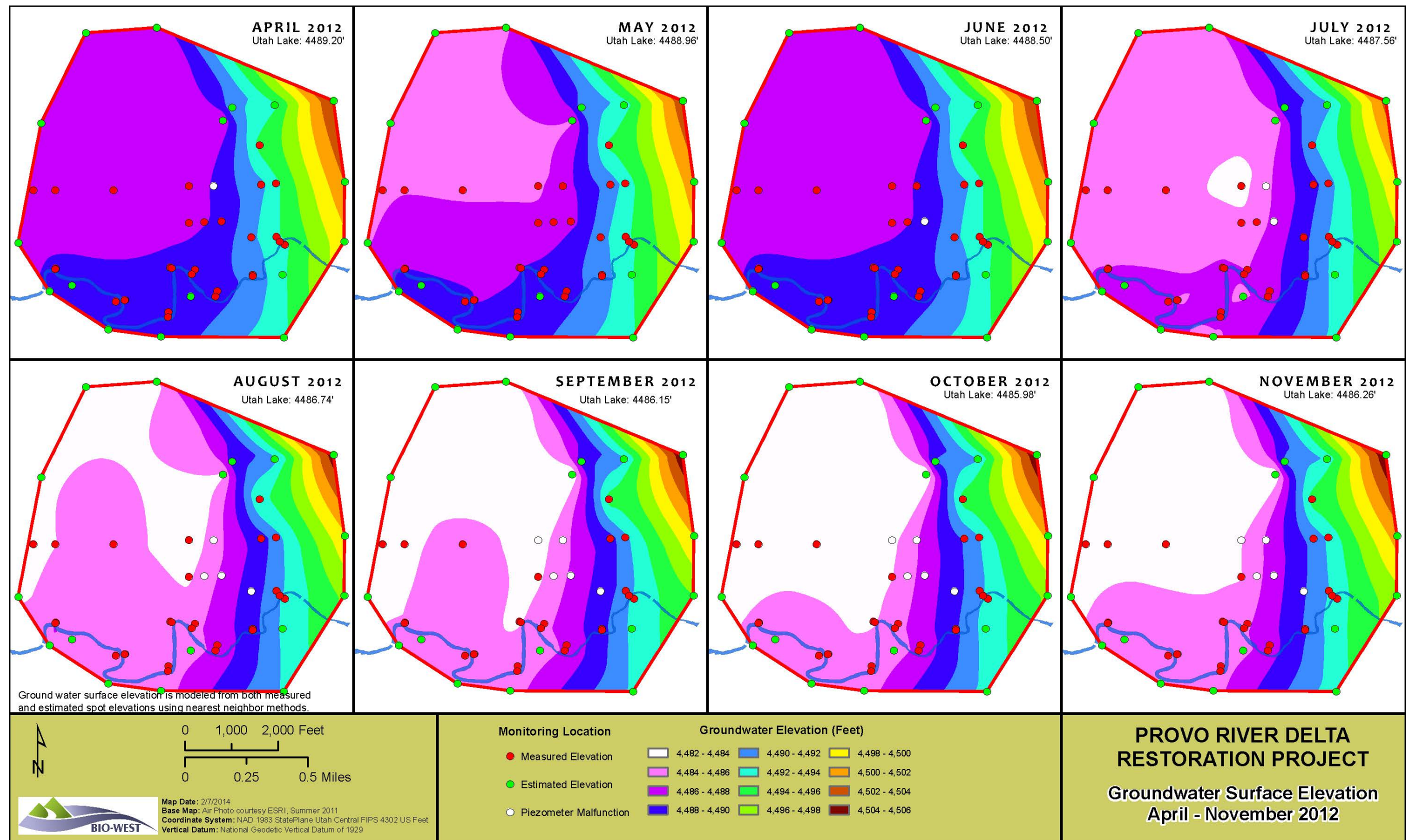


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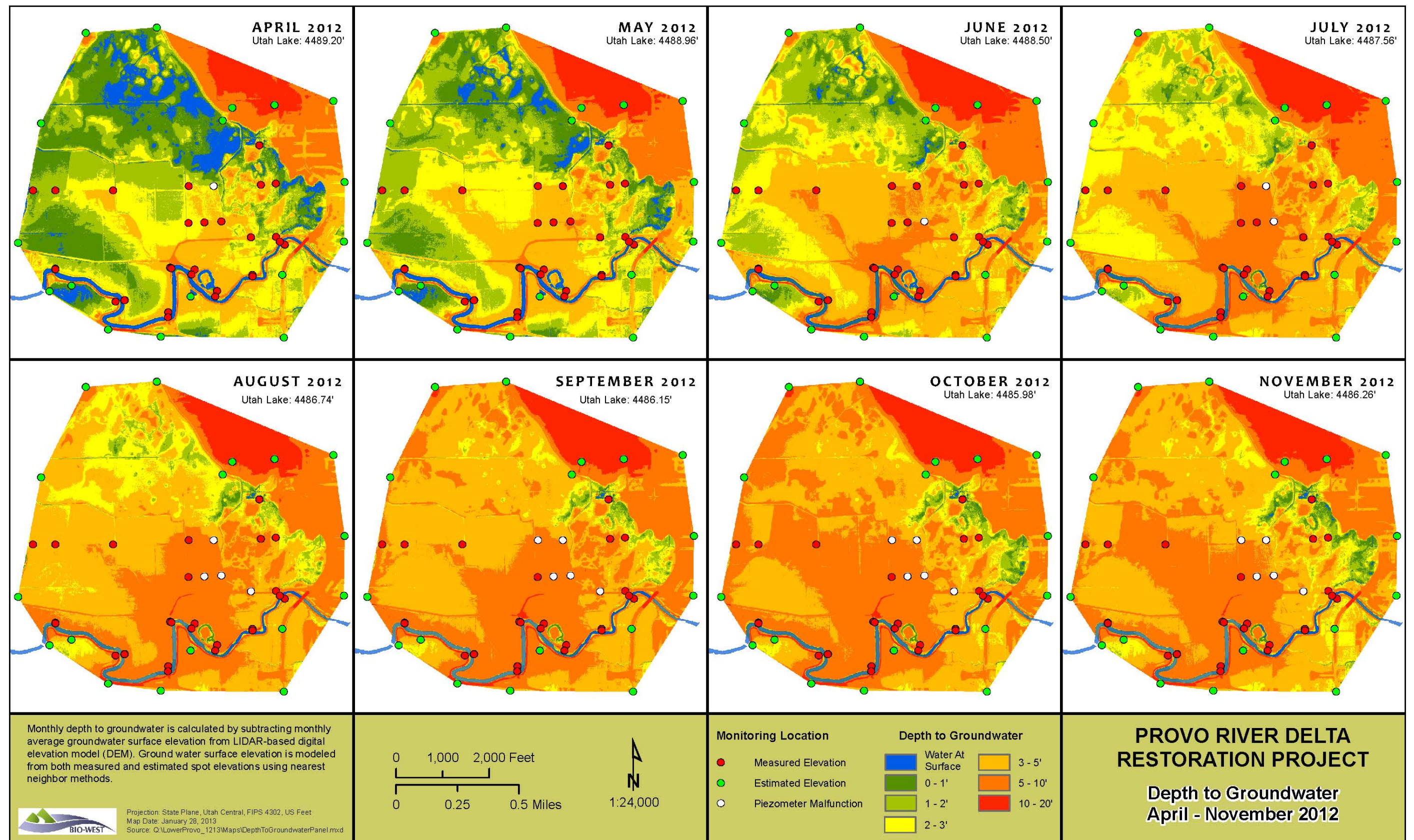


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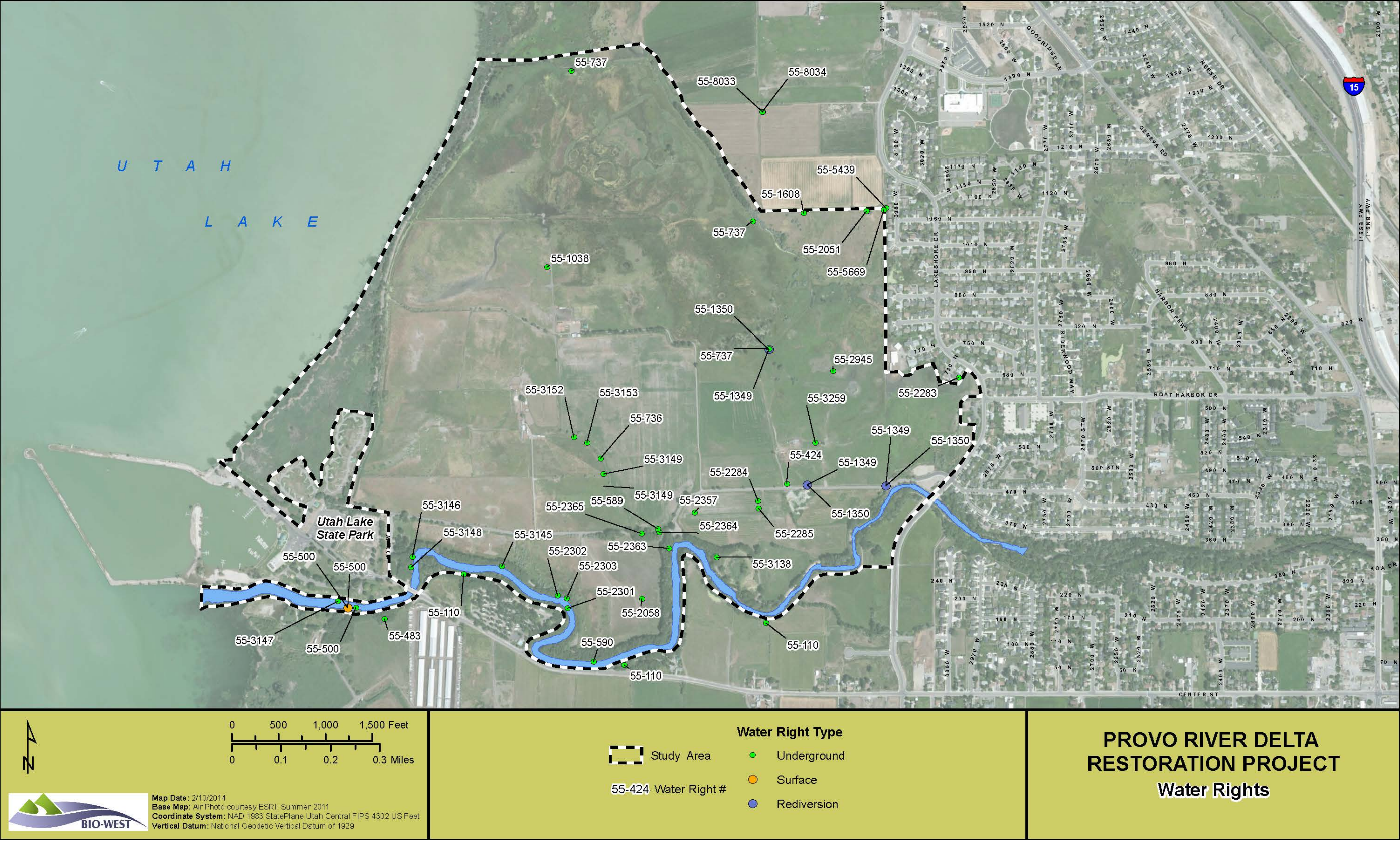


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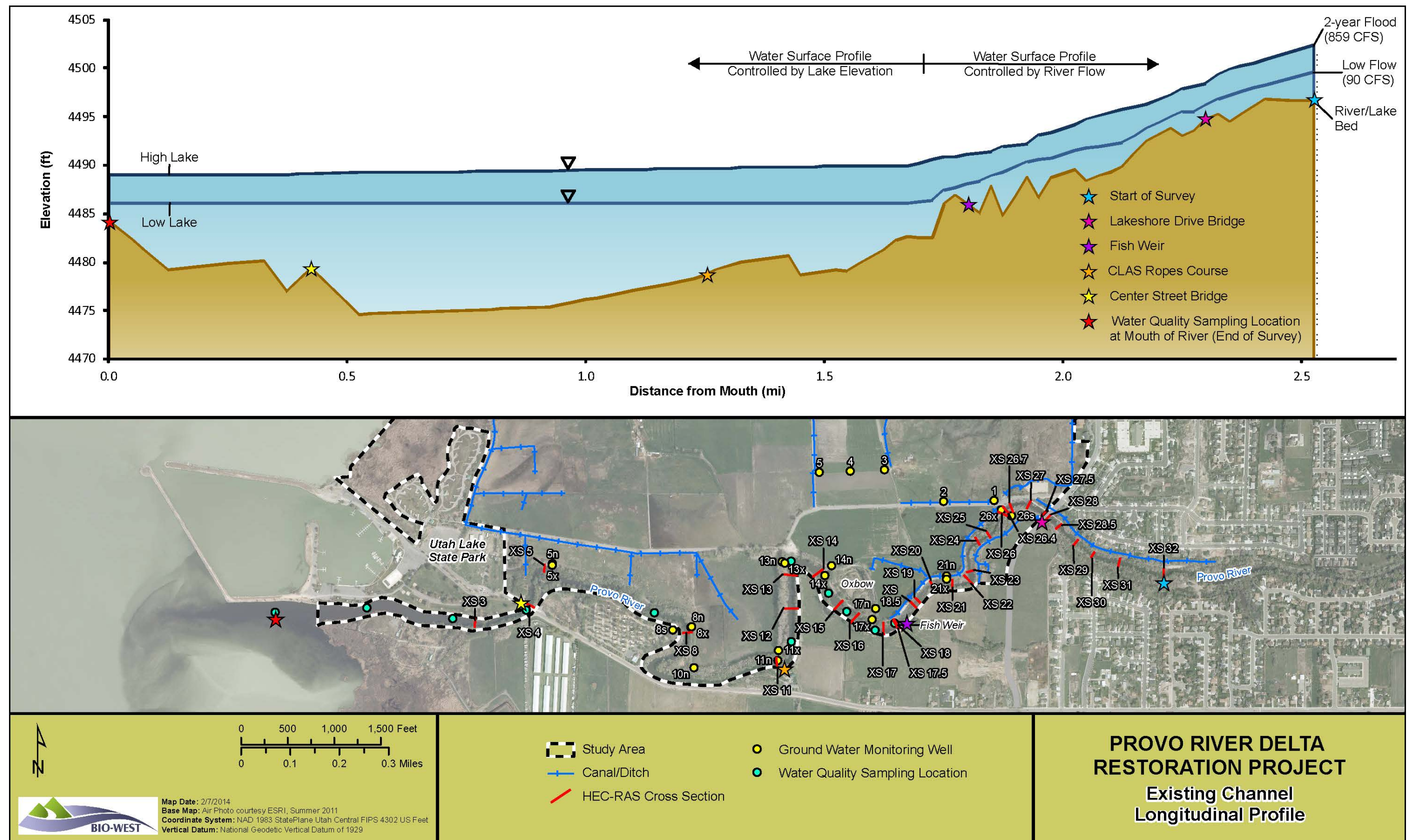


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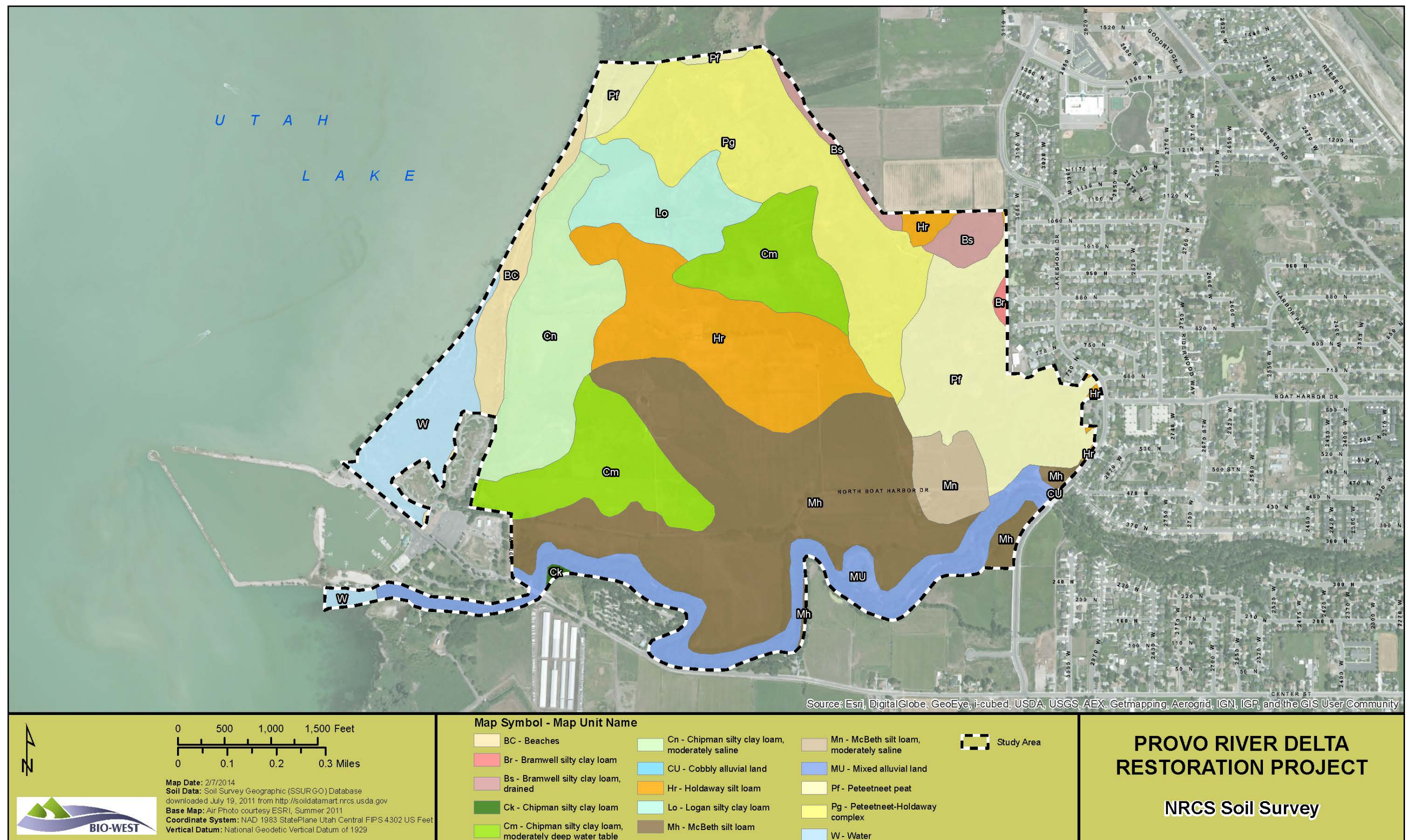


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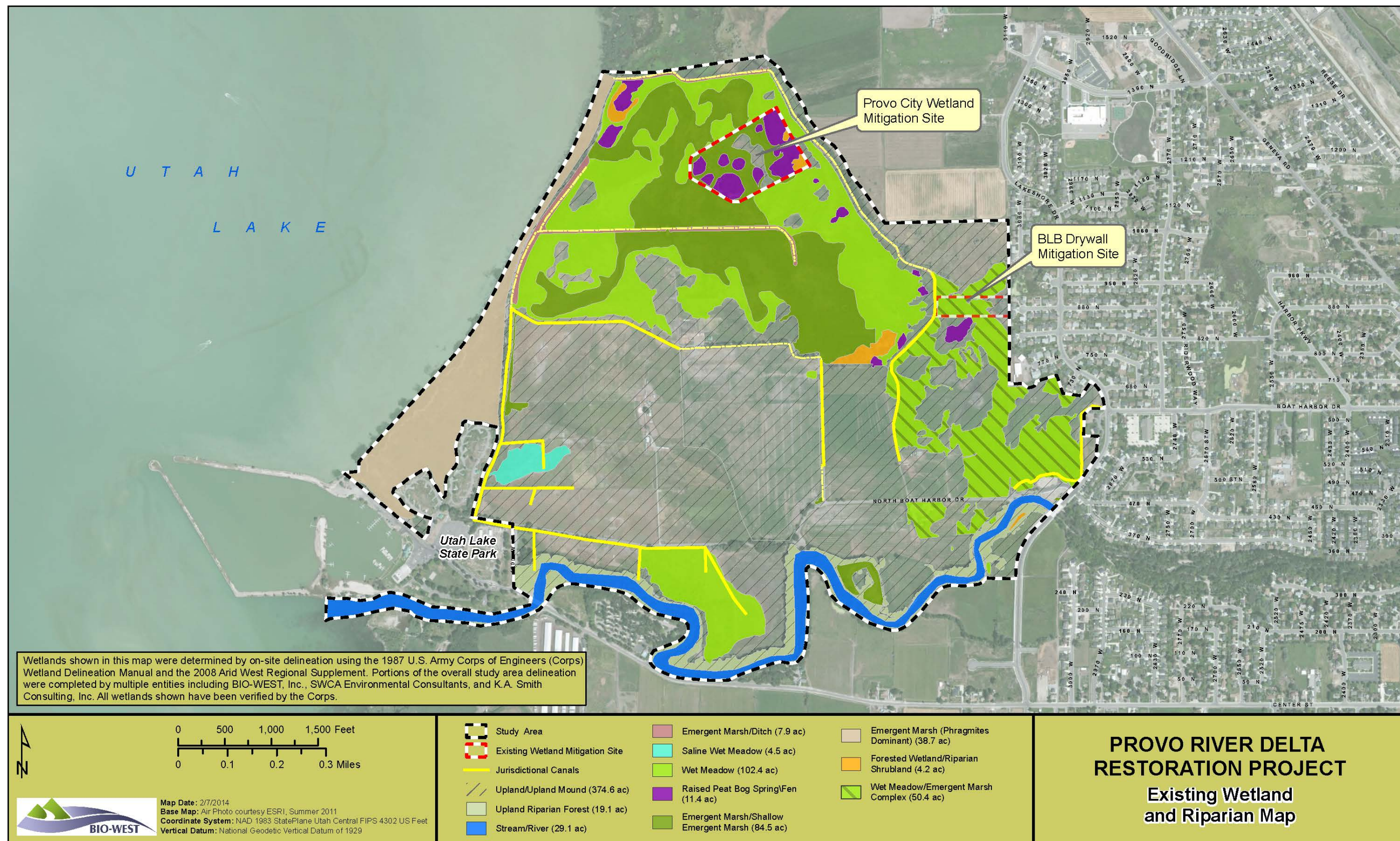


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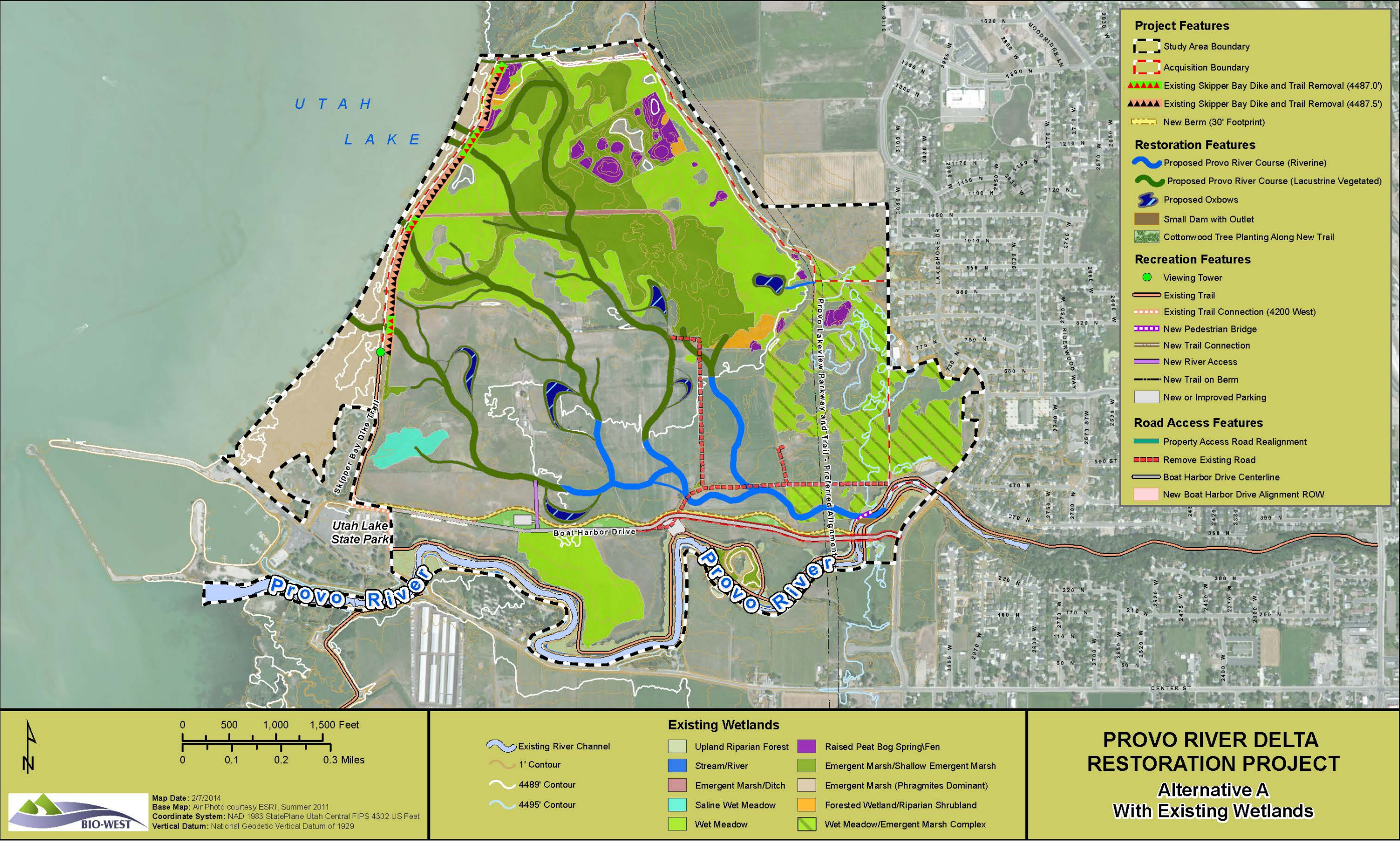


Figure A-19

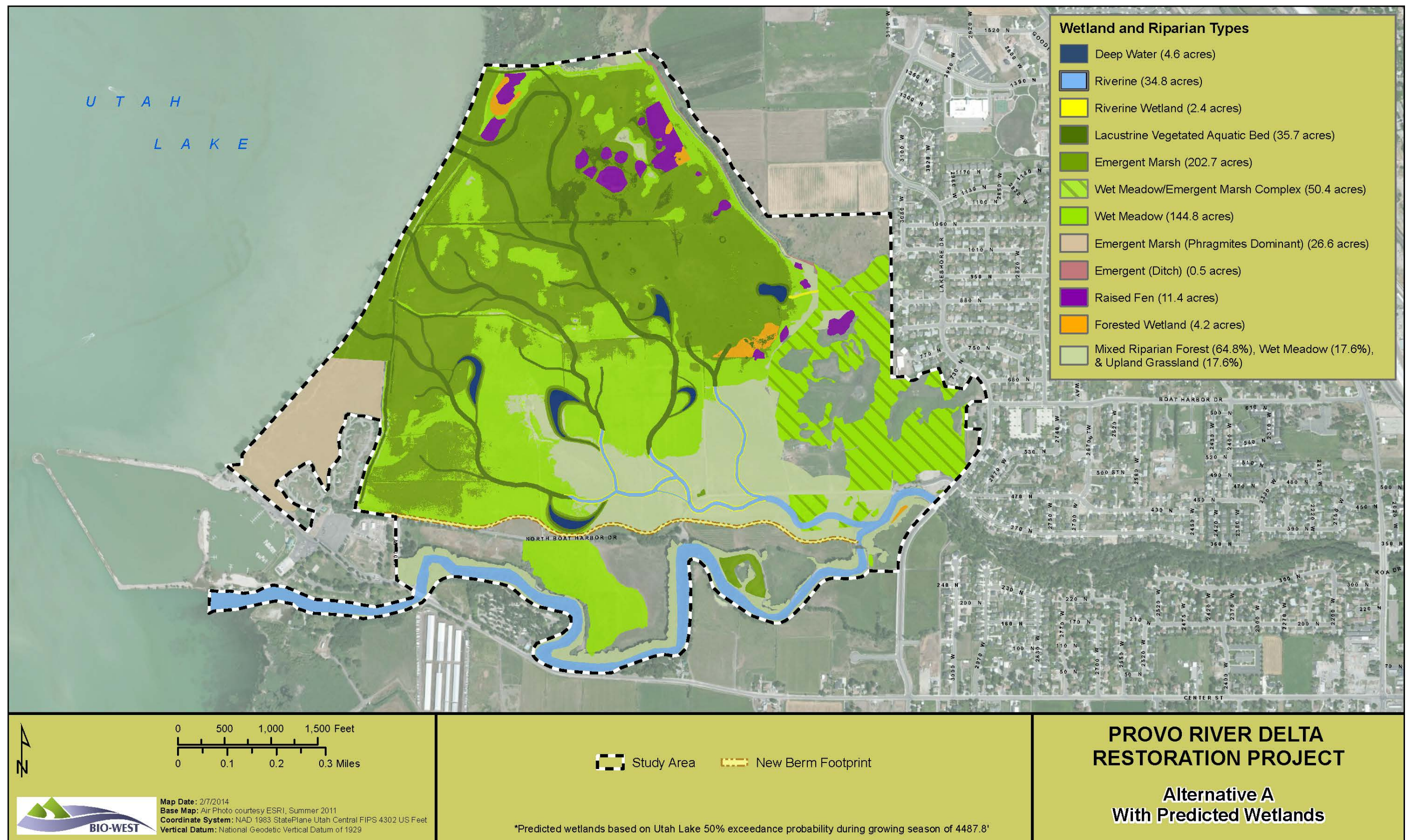


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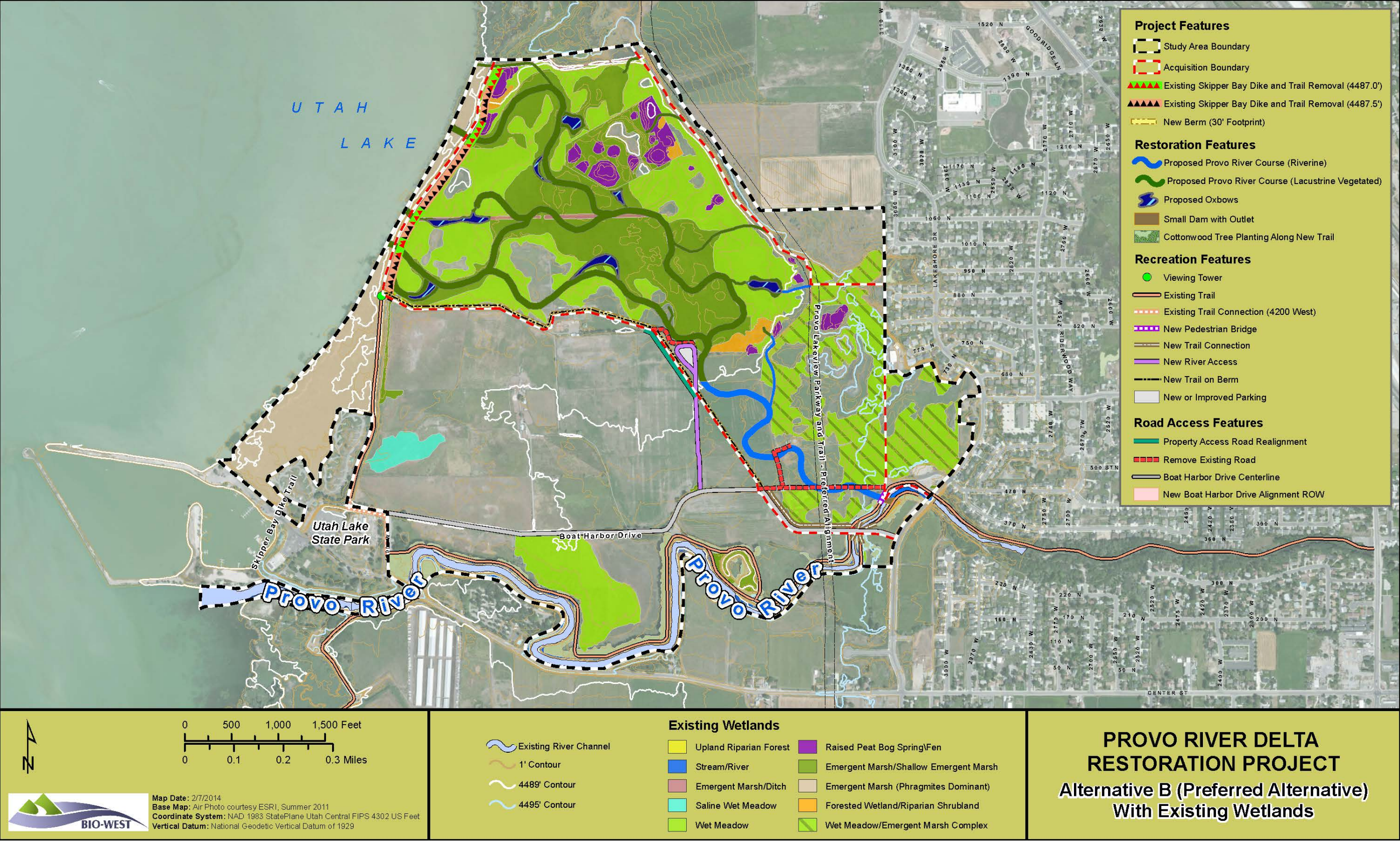


Figure A-21

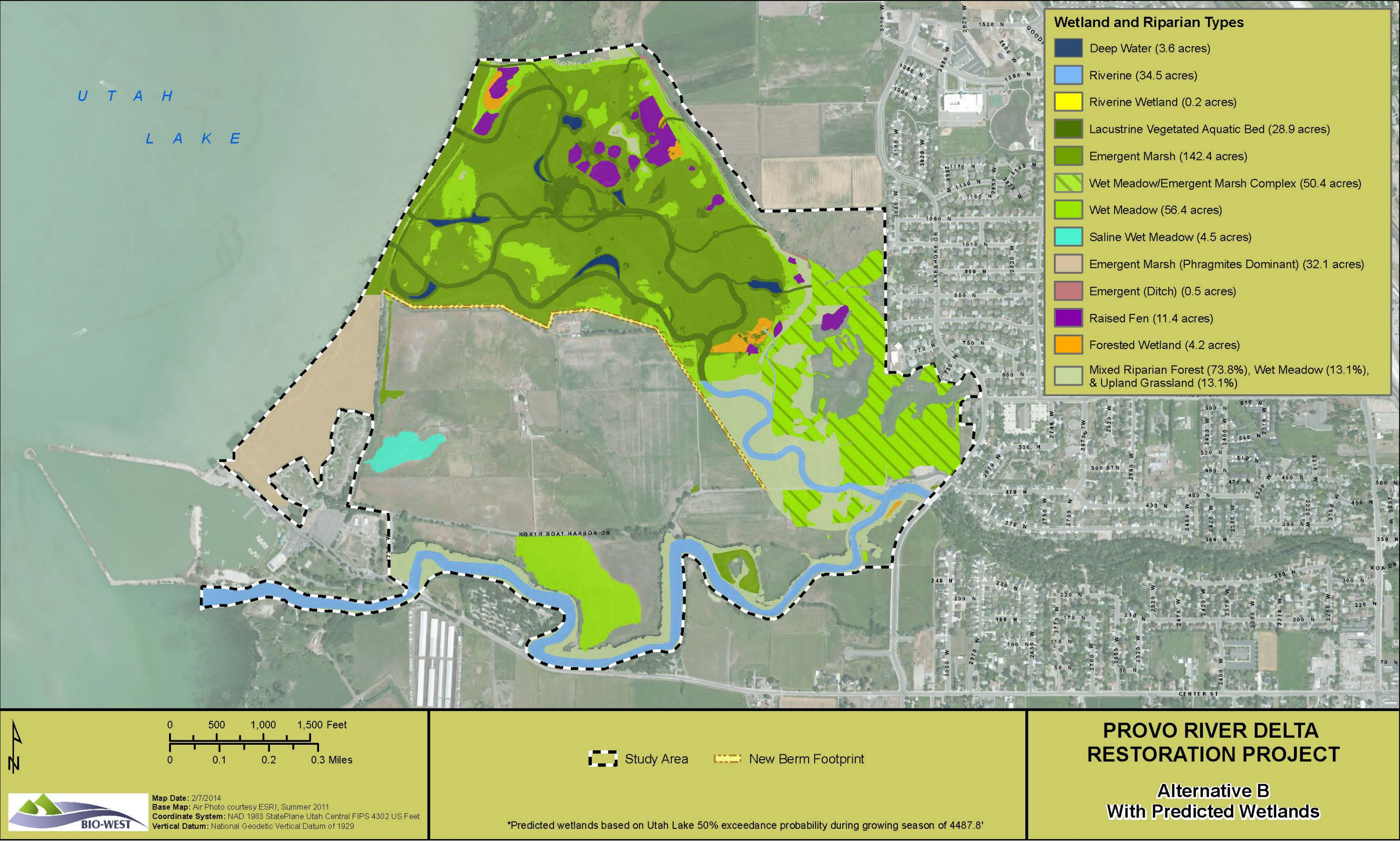


Figure A-22



Figure A-23

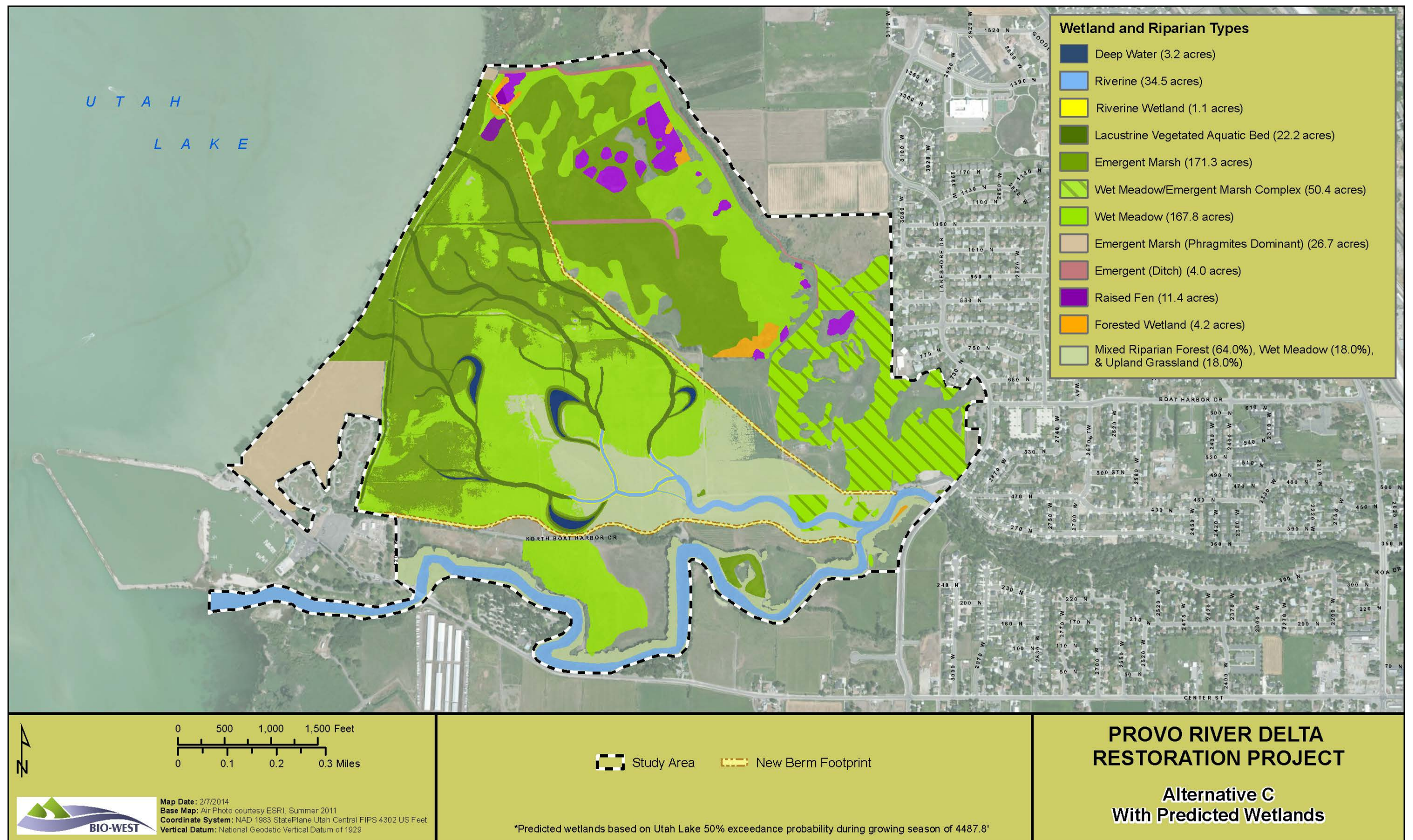


Figure A-24

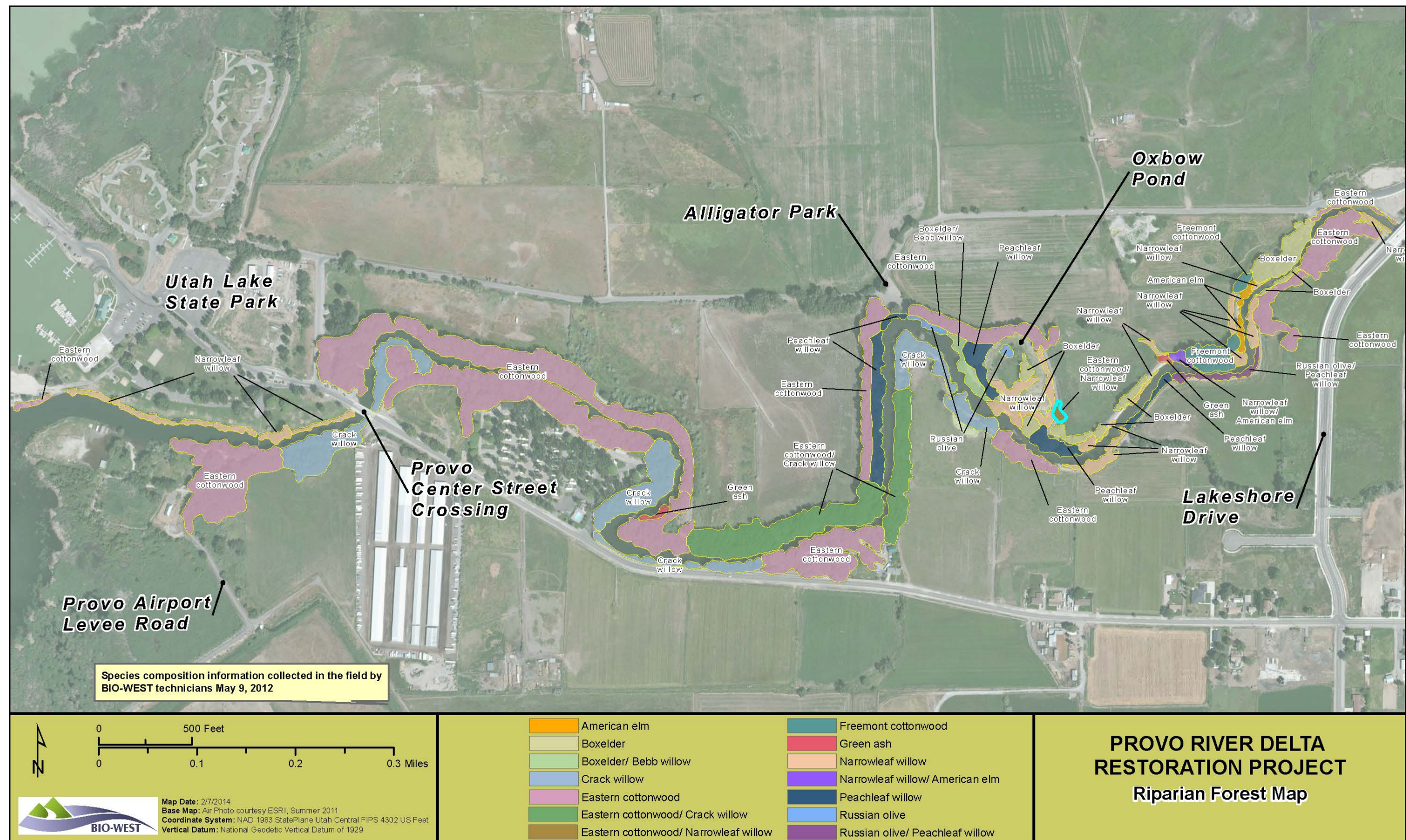


Figure A-25



Figure A-26

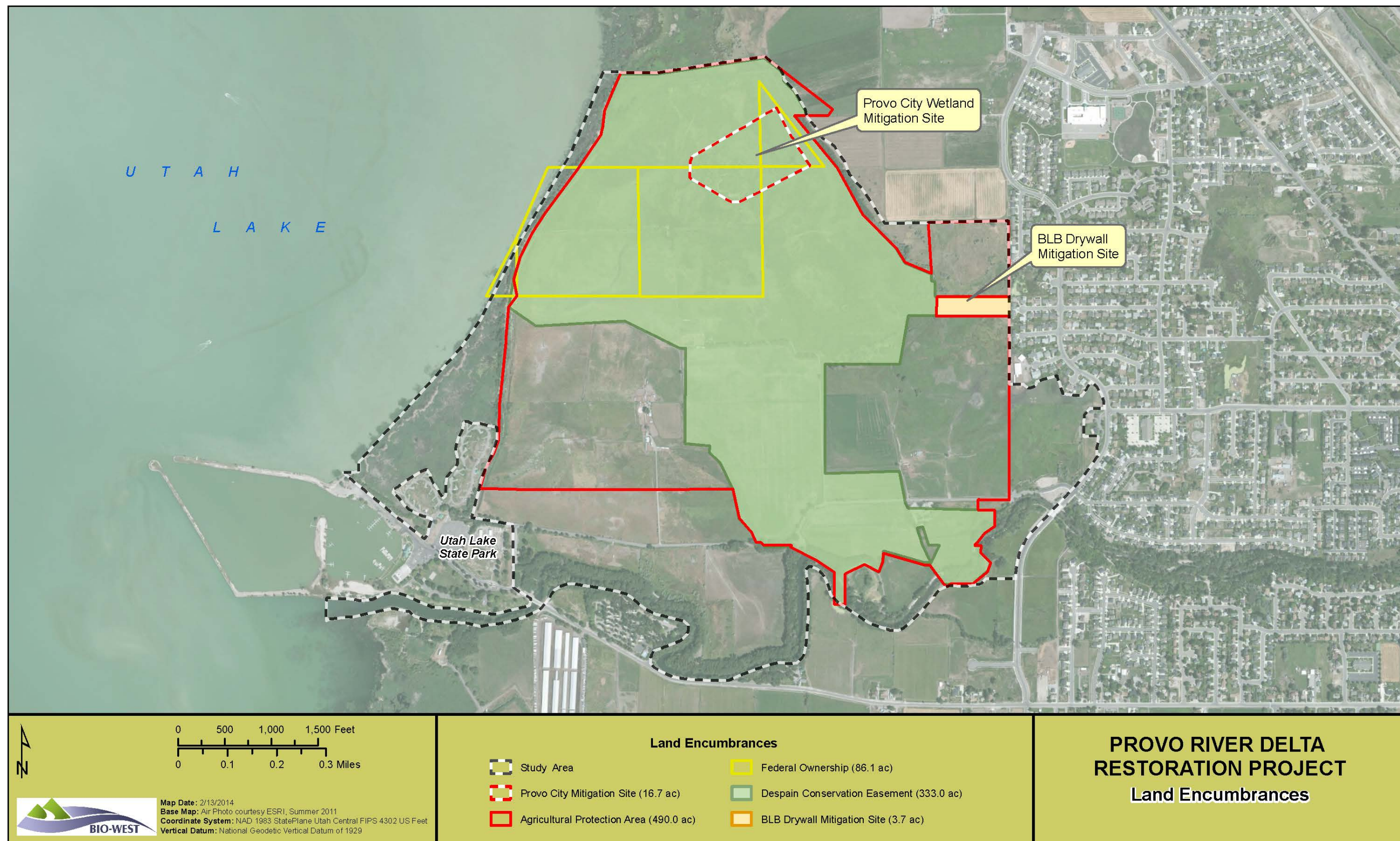


Figure A-27

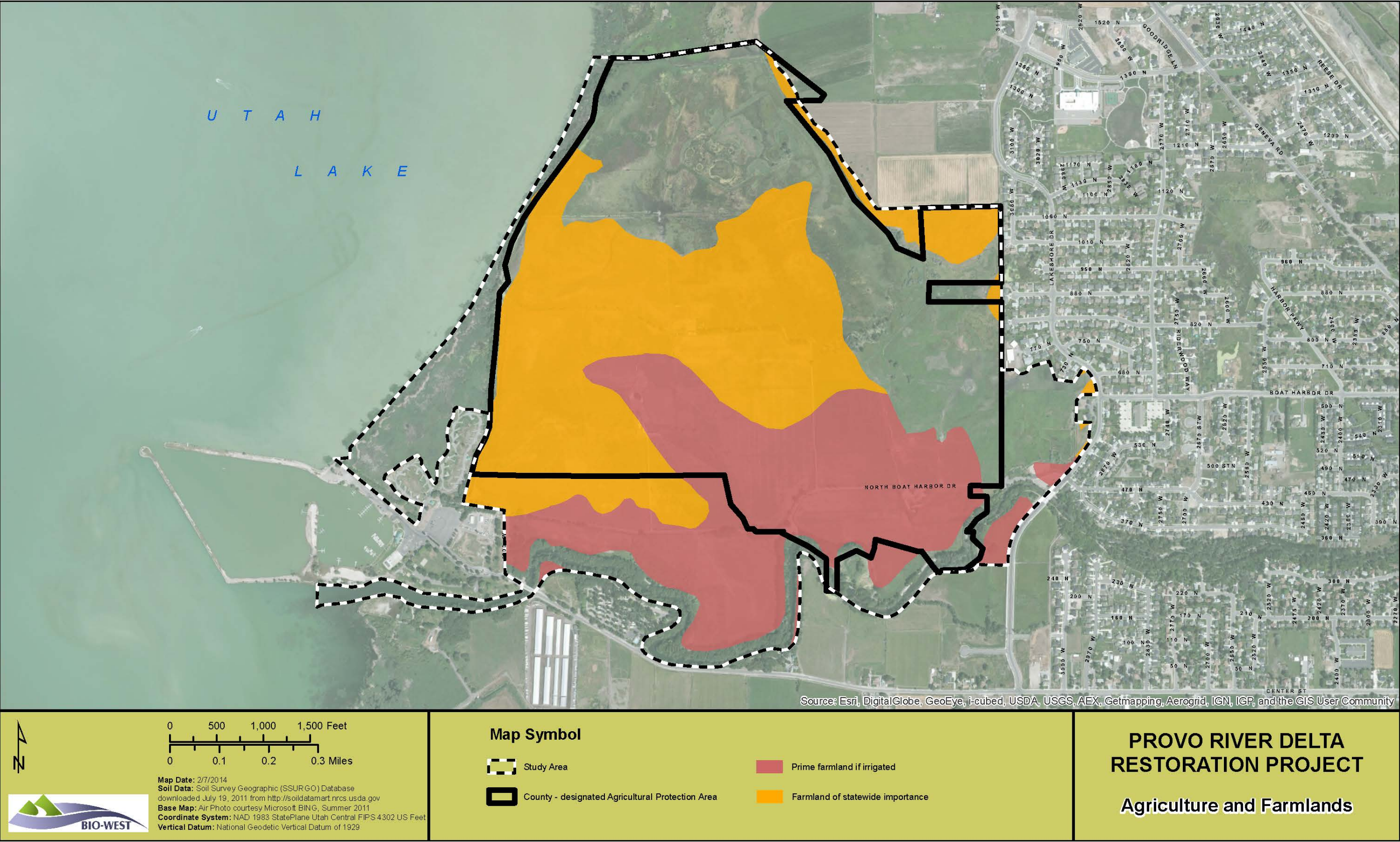


Figure A-28



Figure A-29

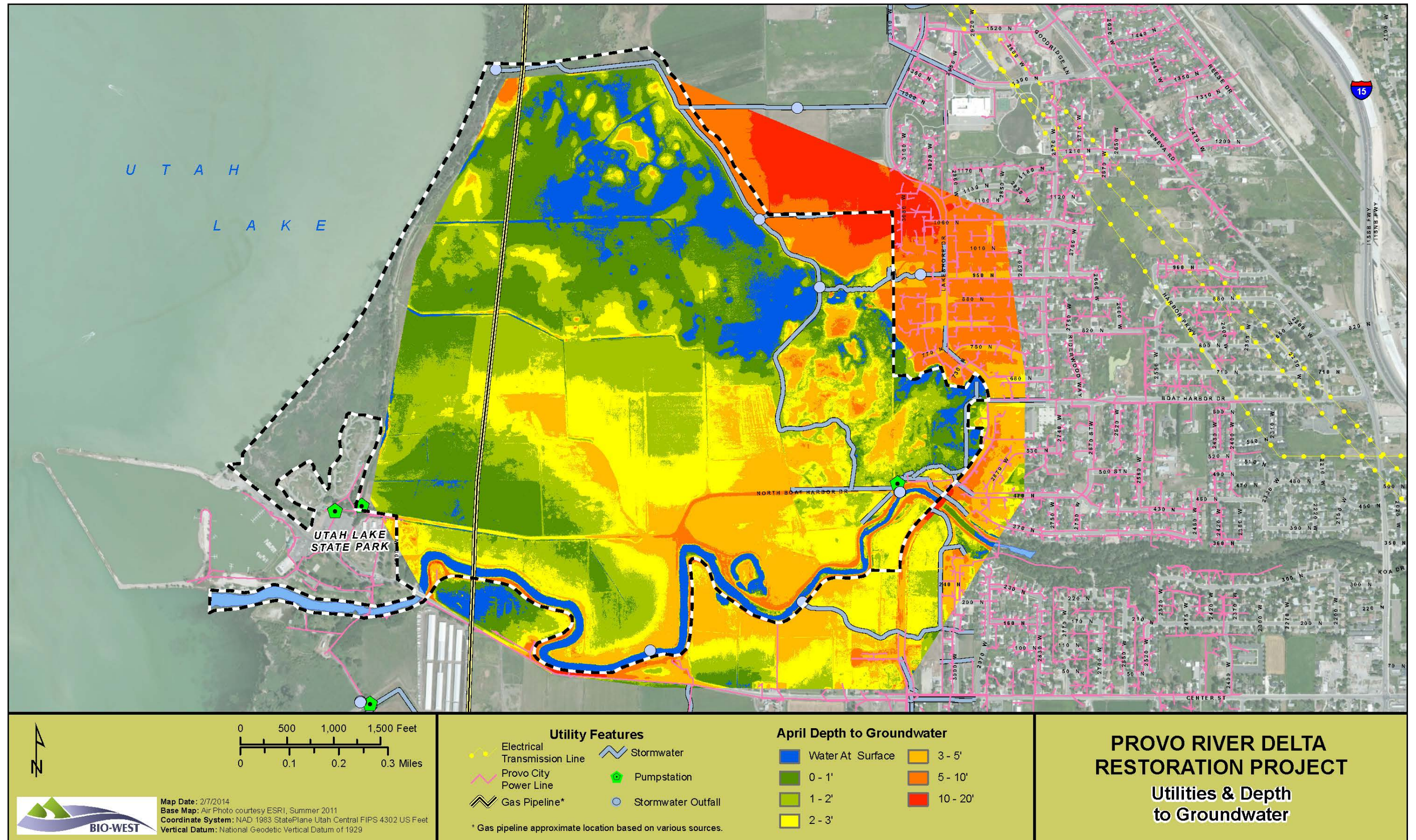
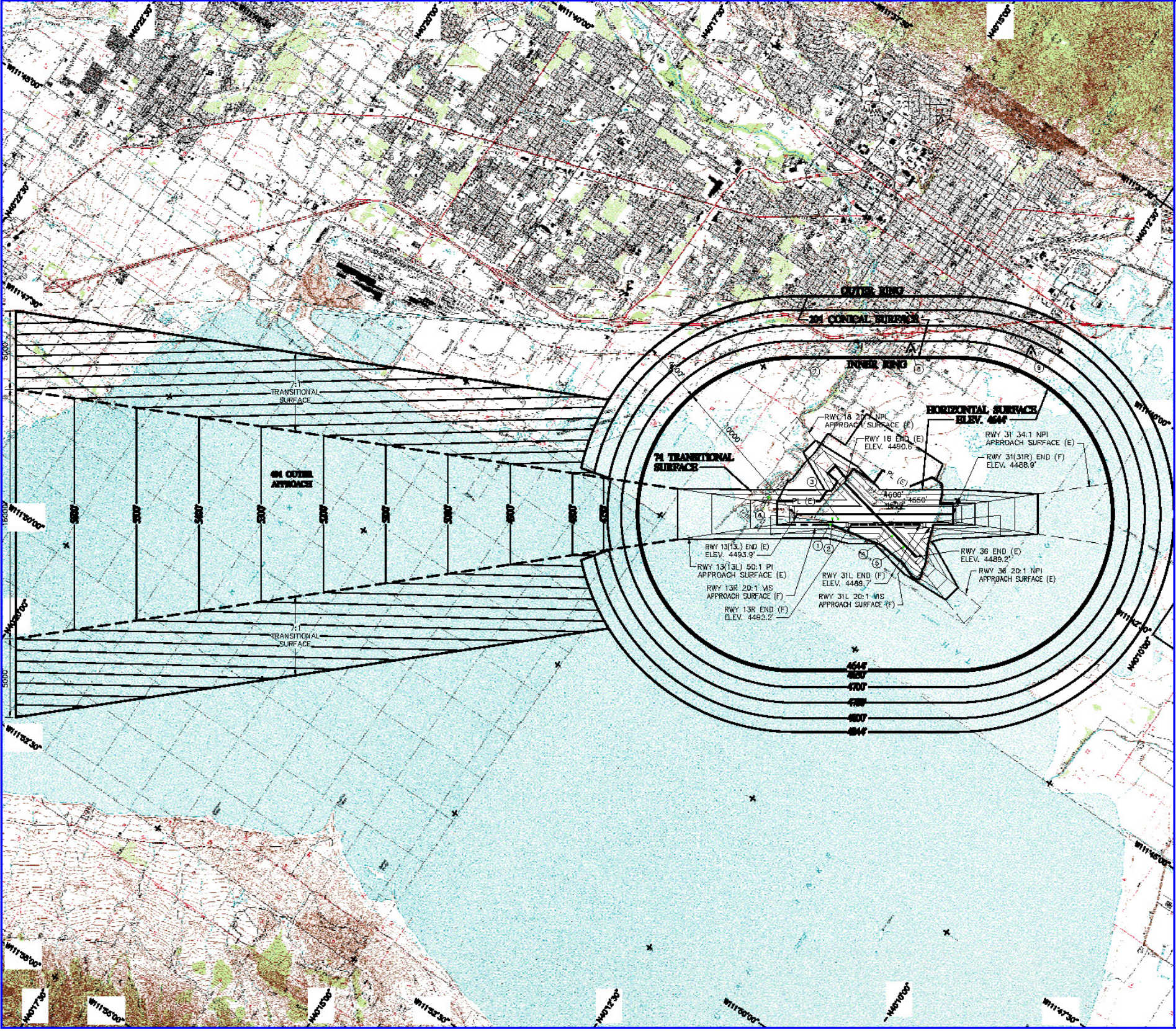


Figure A-30



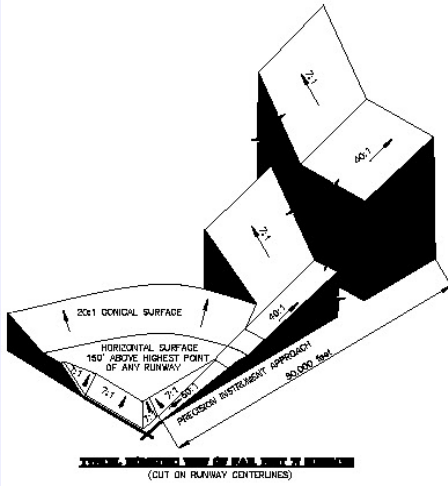
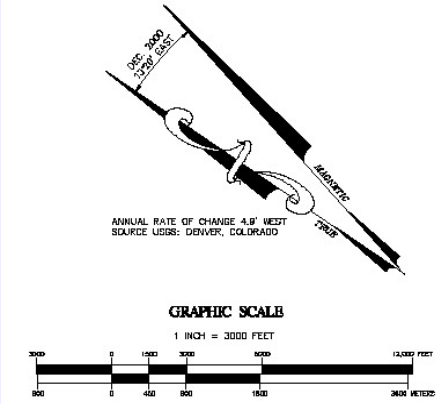
Figure A-31



- NOTE**
1. PRIMARY RUNWAY 13-31(13L/31R) IS 10,000 FEET IN LENGTH AS SHOWN.
PRIMARY SURFACE FOR 13-31(13L/31R) IS 1000 FEET WIDE BY 10,400 FEET IN LENGTH.
PRIMARY SURFACE FOR 18-36 IS 5,002 FEET IN LENGTH AS SHOWN.
PRIMARY SURFACE FOR 18-36 IS 500 FEET WIDE BY 7,002 FEET IN LENGTH.
PRIMARY RUNWAY 13R/31L IS 4,400 FEET IN LENGTH AS SHOWN.
PRIMARY SURFACE FOR 13R/31L IS 250 FEET WIDE BY 4,800 FEET IN LENGTH.
 2. NO TERRAIN OBSTRUCTIONS WERE FOUND. FOR MAN MADE OBSTRUCTIONS SEE OBSTRUCTION TABLE BELOW.
 3. USGS 7.5 MINUTE TOPOGRAPHIC (QUAD) MAPS USED FOR CONTOUR BASE: BRIDAL VEIL FALLS, UTAH, DATED 1983; LEHI, UTAH, DATED 1984; LINCOLN POINT, UTAH, DATED 1983; OREM, UTAH, DATED 1984; PELICAN POINT, UTAH, DATED 1982; PROVO, UTAH, DATED 1993; SARATOGA SPRINGS, UTAH, DATED 1984; SOLDIERS PASS, UTAH, DATED 1993; SPRINGVILLE, UTAH, DATED 1993; TIMPANOGUS CAVE, UTAH, DATED 1993.
 4. AIRPORT ELEVATION IS 4644' (4943.9') ABOVE MEAN SEA LEVEL (MSL).

OBSTRUCTION TABLE				
NO	OBJECT	TOP ELEVATION	PART 77 PENETRATION	DISPOSITION
1	TREE	4541'	26'-7:1 TRANS.	TO BE REMOVED
2	BUSH	4501'	11'-PRIMARY	TO BE REMOVED
3	BUSH	4499'	9'-PRIMARY	TO BE REMOVED
4	TREE	4500'	10'-PRIMARY	TO BE REMOVED
5	TREE	4500'	10'-PRIMARY	TO BE REMOVED
6	TREE	4583'	13'-7:1 TRANS.	TO BE REMOVED
7	TOWER	4647'	3'-HORIZONTAL (OL) (F)	
8	TOWER	4680'	10'-CONICAL (OL) (E)	
9	TOWER	4758'	8'-CONICAL (OL) (E)	

(OL) = OBSTRUCTION LIGHTED



NO.	REVISION	DATE



PROJECT NO.	NO. 10000000
DESIGNED BY:	JEN
DRAWN BY:	JIS
APPROVED BY:	JEN
DATE:	DECEMBER 200

AIRPORT PLAN AIRSPACE PLAN (PART 77)



Figure A-32

PROVO RIVER DELTA RESTORATION PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT

Appendix B: Vegetation Management Plan

Provo River Delta Restoration Project Vegetation Management Plan

Prepared by the Utah Reclamation Mitigation
and Conservation Commission

2013

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Introduction

The Provo River Delta Restoration Project is a multi-agency effort proposed to restore the Provo River delta at Utah Lake. The proposed project would restore habitat in the lower Provo River, essential for spawning, hatching, larval transport, survival, rearing and recruitment of the June sucker population on a self-sustaining basis. The proposed project includes restoring the Provo River/Utah Lake interface from its current channelized location and allowing it to connect to Utah Lake to the north in Skipper Bay, where a delta ecosystem would be restored to provide the diverse habitat required for June sucker recruitment. This action is being undertaken specifically to address the problem of lack of natural recruitment by June sucker, an endangered fish species, in Utah Lake. It responds directly to criteria of the June Sucker Recovery Plan (USFWS 1999) and the June Sucker Recovery Implementation Program (JSRIP) (USFWS 2002).

The proposed project is needed to facilitate recovery of June sucker through restoring spawning and rearing habitat conditions at the Utah Lake-Provo River interface. The proposed project is being evaluated to meet the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. §§4321-4370). Under NEPA guidelines a range of project alternatives are being analyzed to disclose the environmental effects of each alternative. All of the project alternatives evaluated would restore the surface water hydrologic connection between the study area and Utah Lake to some degree. A net increase in wetland acreages is expected for all of the alternatives. Wetland areas would be enhanced and some upland pasture areas would revert to their historic wetland condition. Long term management of the wetland vegetation within the delta project study area is needed to prevent further spread of common reed (*Phragmites australis*) and other weed species of concern (URMCC DEIS in press).

Study Area Description

The study area is approximately 707 acres located adjacent to the east shore of Utah Lake and the Provo River in Utah County, UT (Figure 1). The area is primarily agricultural land used for grazing and hay production and is composed of uplands and wetland areas including emergent marsh, wet meadow, forested wetlands, and raised fens. The majority of the study area is located behind a flood-control dike (Skipper Bay dike) that prevents Utah Lake from inundating the area. West of Skipper bay dike, the study area contains 38.2 acres of emergent marsh dominated by common reed, an invasive emergent weed (URMCC et al 2012). In addition to flood-control, the area contains numerous other hydrologic alterations including drainage ditches, irrigation canals, and surface pumping systems designed to keep the study area from flooding.

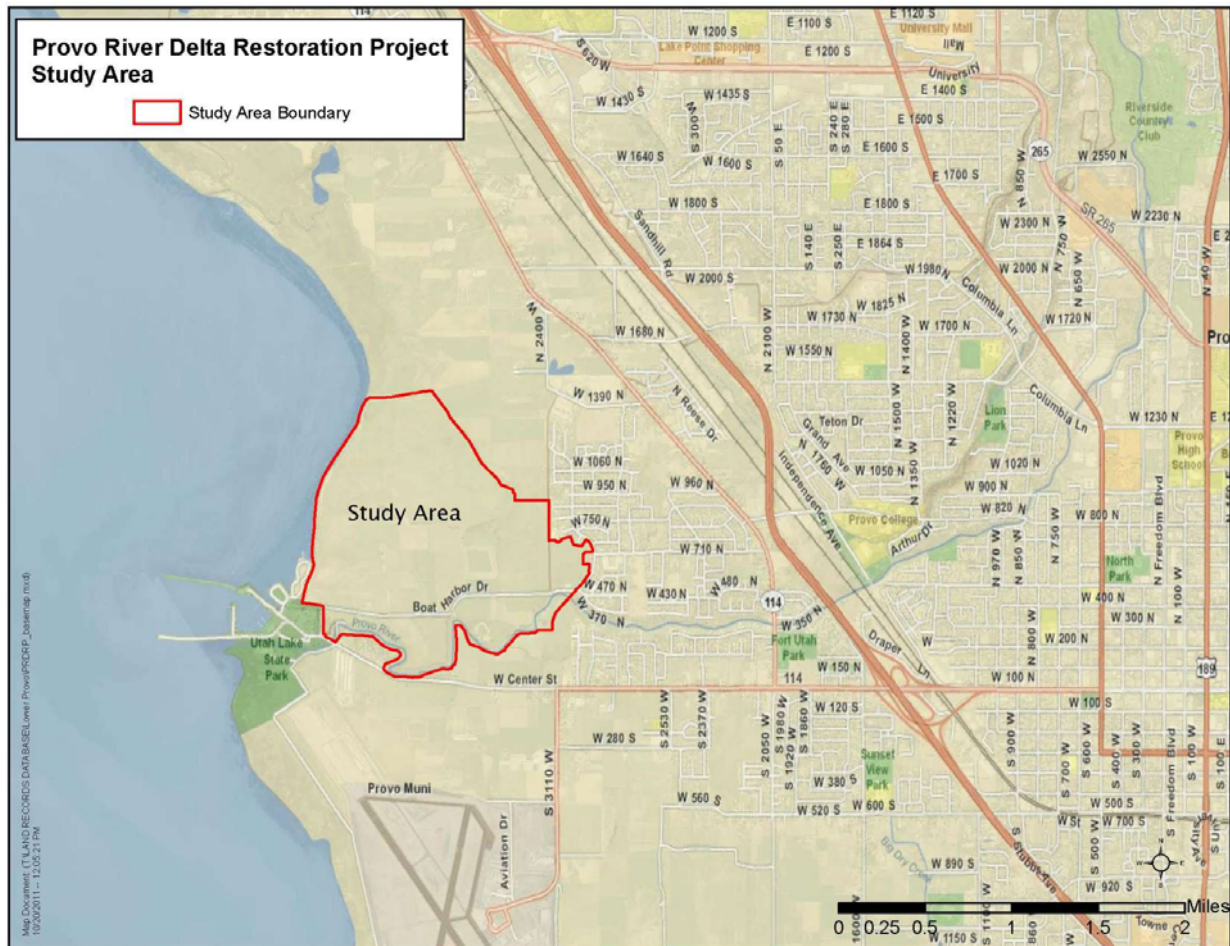


Figure 1. Proposed Provo Delta River Restoration Study Area

Typical species associated with wetlands in the study area include hard stem bulrush (*Schoenoplectus acutus*), Olney's bulrush (*Schoenoplectus americanus*), creeping bentgrass (*Agrostis stolonifera*), arctic rush (*Juncus arcticus*), Nebraska sedge (*Carex nebrascensis*), common spikerush (*Eleocharis palustris*), reed canary grass (*Phalaris arundinacea*), Nuttall's sunflower (*Helianthus nuttallii*), saltgrass (*Distichlis spicata*), cattail (*Typha latifolia*), coyote willow (*Salix exigua*), eastern cottonwood (*Populus deltoids*), Fremont cottonwood (*Populus Fremontii*), and common reed.

Federally threatened and endangered species known to occur or potentially occur within the project study area include Ute ladies' tresses (*Spirantes diluvialis* – threatened) and June sucker (*Chasmistes liorus* -endangered).

Vegetation Management Goals

The purpose of this Vegetation Management Plan is to direct the project area vegetation management, once an alternative is selected and implemented, to provide habitat to aid in June sucker recovery and restore, preserve, and improve other fish, wildlife, riparian, and wetland habitats. The goal for vegetation management in the project area is to maintain diverse plant communities to provide June

sucker rearing and spawning habitat and to restore, improve, and preserve other fish and wildlife habitat. This vegetation management includes the control of noxious weeds or other undesirable vegetation in the project area.

Weed Species of Concern

The Utah State Department of Agriculture classifies noxious weeds within the state into three classes under Section 4-17-3, Utah Noxious Weed Act: Class A (Early Detection Rapid Response), Class B (Control) and Class C (Containment). Please refer to <http://www.ag.utah.gov/divisions/plant/noxious/documents/noxUtah.pdf> for additional information.

The state listed noxious weeds in Table 1 are all species of concern within the project study area. In addition to the state listed noxious weeds, Table 2 describes other non-listed weedy species that are of concern within the project study area. Of the species listed in Tables 1 and 2, the weed species of highest concern are knapweeds, thistles, Tamarisk, and Russian olive (*Elaeagnus angustifolia*). Common reed (*Phragmites australis*) which Utah County declared a noxious weed in 2009 is the species of overall highest concern.

Table 1, Statewide Noxious Weed, listed by class.

Common Name	Scientific Name	Annual or Perennial
Class A: Early Detection Rapid Response (EDRR) Declared noxious weeds not native to the state of Utah that pose a serious threat to the state and should be considered as a very high priority.		
Blackhenbane	Hyoseyamus niger (L.)	Annual or biennial
Diffuse Knapweed	Centaurea diffusa (Lam.)	Biennial or perennial
Johnson Grass	(Sorghum halepense (L.) Pers.	Perennial
Leafy Spurge	Euphorbia esula L.	Perennial
Medusahead	Taeniatherum caput-medusae	Annual
Oxeye daisy	Chrysanthemum leucanthemum L.	Perennial
Purple Loosestrife	Lythrum salicaria L.	Perennial
St. Johnswort	Hypericum perforatum L	Perennial
Spotted Knapweed	Centaurea maculosa Lam.	Biennial or Perennial
Sulfur cinquefoil	Potentilla recta L.	Perennial
Yellow Starthistle	Centaurea solstitialis L	Annual
Yellow Toadflax	Linaria vulgaris Mill.	Perennial
Class B: (Control) Declared noxious weeds not native to the state of Utah, that pose a threat to the state and should be considered a high priority for control		
Bermudagrass	Cynodon dactylon (L.) Pers	Perennial
Dalmation Toadflax	Linaria dalmatica (L.) Mill	Perennial
Dyer's Woad	Isatis tinctoria L.	Annual, Biennial or Perennial
Hoary cress	Cardaria spp.	Perennial
Musk Thistle	Carduus nutans L.	Biennial

Perennial Pepperweed	<i>Lepidium latifolium</i> L.(Tall Whitetop)	Perennial
Poison Hemlock	<i>Conium maculatum</i> L.	Biennial
Russian Knapweed	<i>Centaurea repens</i> L.	Perennial
Scotch Thistle	<i>Onopordium acanthium</i> L.(Cotton Thistle)	Biennial
Squarrose Knapweed	<i>Centaurea virgata</i> Lam. Ssp	Perennial
Class C: (Containment) Declared noxious weeds not native to the state of Utah that are widely spread but pose a threat to the agricultural industry and agricultural products with a focus on stopping expansion.		
Canada Thistle	<i>Cirsium arvense</i> (L.) Scop.	Perennial
Field Bindweed	<i>Convolvulus</i> spp. (Wild Morning-glory)	Perennial
Houndstounge	<i>Cynoglossum officinale</i> L.	Biennial
Quackgrass	<i>Agropyron repens</i> (L.) Beauv.	Perennial
Saltcedar (Tamarisk)	<i>Tamarix ramosissima</i> Ledeb.	Perennial

Table 2. Plants of concern that are not on the noxious weed list (URMCC DEIS in press).

Name	Scientific name	Annual/Perennial
Lambsquarter	<i>Chemopodium berlandieri</i>	Annual
Annual ragweed	<i>Ambrosia artemisiifolia</i>	Annual
Curly dock	<i>Rumex crispus</i>	Perennial
Spiny cocklebur	<i>Xanthium spinosum</i>	Annual
Stinging nettle	<i>Urtica dioica</i>	Perennial
Siberian elm	<i>Ulmus pumila</i>	Perennial
Russian olive	<i>Elaeagnus angustifolia</i>	Perennial
Fivehorn smotherweed	<i>Bassia hyssopifolia</i>	Annual
Reed canarygrass	<i>Phalaris arundinacea</i>	Perennial
Common reed ¹	<i>Phragmites australis</i>	Perennial

¹Declared a noxious weed by Utah County in 2009.

Areas with recent disturbance are more likely to provide habitat for noxious species establishment. Along the Provo River and canals in the study area, annual high water deposits seeds of Russian olive, Siberian Elm, Tamarisk, and common reed. Riparian areas and canals are especially vulnerable to nonnative species invasion and control of these areas is a high priority.

Common reed, which is conventionally referred to as “phragmites,” is of particular concern within the project area as it is a nonnative grass that has rapidly spread around Utah Lake, crowding out diverse native wetland vegetation, and reducing the availability and quality of wetland habitats. Large monocultures of common reed exist immediately adjacent to the project study area to the north and west. The majority of Utah Lake shoreline is dominated by common reed (Utah Lake Commission 2009).

Other Utah Lake Area Vegetation Management Programs

There are currently several other agencies actively managing weeds around Utah Lake. These agencies and a brief description of their management duties are described below. As part of the proposed restoration project, the Utah Reclamation Mitigation and Conservation Commission is working closely with these agencies to ensure that overall weed management strategies are effectively coordinated. Coordination with these agencies will continue through project construction and into the long term management of weeds on the project area once an alternative is selected and implemented.

Utah County Public Works- Utah County's weed control division is responsible for enforcing the Utah state weed laws. They work with the Utah County Weed Control Board, a 5 member board appointed by the Utah County Legislative body to educate and find new ways to control noxious weed and enforce the state weed laws. The members are assigned to different areas of the county and work with the people in their areas to address their concerns. They are cooperating with the Utah Lake Commission and the Utah Division of Forestry Fire and State Lands on weed control on the Utah Lake Shoreline.

Utah Lake Commission- The Utah Lake Commission is made up of Utah County municipalities, state agencies and water users. It is the Utah Lake Commission's goal to promote multiple public uses of the lake, facilitate orderly planning and development in and around the lake, and enable individual Commission members to govern their own areas.

The Utah Lake Master Plan (Utah Lake Commission 2009) is the guiding document for the Utah Lake Commission and functions as a management plan for the Utah Division of Forestry Fire and State Lands(State Lands). The Document provides policy framework for decisions on actions taken to improve and protect Utah Lake. The Master Plan's Natural Resource policies include encouragement of control of invasive or undesirable plant species. Natural Resources Goal 4 describes a desired future condition of existing invasive species being controlled and effectively managed to minimize their negative effects on Utah Lake Natural resources. The Master Plan further states in the Invasive species objective for phragmites control: "The [Utah Lake] Commission will actively promote efforts to control phragmites and [be] a resource for information on effective phragmites control measures. Phragmites is an invasive, non-native species that result in a monoculture that reduces habitat for numerous beneficial species."

*Utah Division of Forestry Fire and State Lands-*The Utah State Lands prescribes general land management objectives for sovereign lands, which includes the bed of Utah Lake. The Utah Lake Master Plan referenced above also serves as the State Lands Comprehensive Management Plan for Utah Lake. Since 2008, State Lands, Utah County Weed Control Division and the Utah Lake Commission have been treating sections of the Utah Lake shoreline to remove phragmites, tamarisk and Russian olive. By 2012, 25 miles of shoreline have been treated, with the goal of clearing the whole shoreline (approximately 75 miles) in 10 years (<http://utahlake.gov/vile-weed-restoring-shoreline-with-controlled-reed-removal/>, accessed June 2013).

Select Pertinent Laws and Regulations

The Clean Water Act and the Utah Division of Water Quality Utah Pollutant Discharge Elimination System(UPDES)- The Pesticide General Permit (UPDES Number UTG170000) is a State of Utah general permit regulating point source discharges to waters of the State from the application of pesticides. This permit regulates the use of pesticides on or near waters of the state in Utah for purposes of control of mosquitos and other insect pests, weed and algae control, nuisance animal control and forestry canopy pest control. The permit holder is required to file a notice of intent to apply pesticides, describing the waters that will receive the pesticides. The permit also requires that pesticide use effectiveness is monitored and that an annual report of the acreage treated is developed.

Federal Insecticide, Fungicide and Rodenticide Act, June 25, 1947, as amended (FIFRA). 7 USC 136 et seq. This is the basic law that regulates pesticide use in the United States. This act covers pesticide registration, labeling, use, applicator certification, disposal, transportation and research as well as administrative and regulatory activities.

Executive Order 13112- Invasive Species This executive order requires that Federal Agencies and federally funded projects monitor and control invasive and noxious species. This order defines invasive species, requires federal agencies to address invasive species concerns and to not authorize or carry out new actions that would cause or promote the introduction of invasive species. It also established the National Invasive Species Council which is tasked with ensuring that Federal programs and activities to prevent and control invasive species are coordinated, effective and efficient.

Utah Noxious Weed Act-Utah Administrative Code, R68-9, directs state and county agencies and private citizens to control and manage undesirable plants on the lands they manage or own. State weed laws have made exotic plant management part of a state and local community effort.

Management Techniques

Vegetation management will take place during all project phases: design, implementation or construction, and operation and maintenance. It will consist of vegetation inventory, including mapping, noxious weed control, revegetation with desirable species, monitoring and maintenance activities.

During the design phase, all habitats would be mapped, including those dominated by weed species. This mapping would be used to refine the specific areas in which weed treatment would be required before, during and after construction. It is recommended that phragmites in particular, be mapped and controlled before ground disturbing activities occur, as this species thrives in disturbed habitats and may be one of the first to colonize a newly disturbed site (OMNR 2011). Recommended seed mixes and plant lists for revegetation would be developed during the final design phase.

All proposed project alternatives contain some construction activities including the excavation of a new channel for the Provo River as well as removal of some existing berms/dikes and construction of new ones. Any ground disturbing activities provide an opportunity for weed introduction or spreading into an area.

Construction guidelines recommended to prevent noxious weed introduction are as follows:

Soil Removal and Stockpiling - Top-soil should be stripped from all wetland areas to a depth of 18 inches or a depth where significant (greater than 50%) rock, stone or cobble, are encountered, whichever comes first. Due to on site conditions it is likely that all top soil in the study area contains a robust seed bank of phragmites. Top-soil should be stockpiled separately from all other soil and should not be reused during construction. Sub-soil from wetland areas with less than 40% rock, stone, cobble, etc. should be stockpiled separately. Sub-soil with more than 40% rock, stone, or cobble, should be stockpiled separately, used to construct features or spoiled.

The top 12 inches of soil from areas covered with non-native plant species (or where weeds are common) should be stripped and spoiled (buried deep). Sub-soil in these areas should be treated as above.

Soil Placement - Suitable wetland sub-soil should be used, to the maximum extent possible, to topsoil (no less than 1 foot deep, with top-soil over sub-soil) wetland and riparian areas. With the exception of constructed berms, it is not likely that construction activities will require placement of top soil for this project. Sideslopes of constructed berms and other upland areas should be topped with the best sub-soil (least amount of rock, stone or cobble) on top.

Since working the soil will bring larger materials to the top, soil should be placed following all construction and final grading, and just before planting, to avoid any activity that would result in compaction which would require re-working the soil. Soil should be transported or dumped in suitable locations/piles so that it can be spread with a backhoe bucket and not driven on (even by the backhoe) or compacted in any way.

Haul Routes - Haul routes should be minimized, and, to the maximum extent practicable, should not cross wetlands, wet areas, or constructed features that will be planted. Constructing a wet crossing is far better than having crossings in multiple locations. If crossing a constructed feature that will be planted becomes necessary, it should be "ripped" prior to topsoiling. No crossing should occur on topsoiled areas.

Compaction severely inhibits root growth and water percolation. For this reason, it is a significant obstacle to revegetation. To the maximum extent possible, activities that would result in compaction should be avoided. It should be noted that working soils when they are at or near field capacity (wet) results in significant compaction.

Revegetation of disturbed sites-It is recommended that all disturbed land be planted with the recommended native species seed mix or plants the same year it is disturbed unless disturbances

continue over more than one year. Site specific seed mixes and plant lists will be developed during the final design phase of the project.

Area maintenance will take place once construction is complete. Weed control will be included in these activities.

In terms of listed or sensitive species and/or areas, vegetation management will be conducted consistent with the Commission's Integrated Pest Management Plan (Commission 2012). Sensitive areas include wetlands, in particular, those habitats occupied by Ute ladies' tresses (Federally listed as threatened species), and other state sensitive or conservation species. Noxious weed treatment will be conducted under the supervision of Mitigation Commission personnel. Herbicides will be spot-sprayed on infested areas to avoid contact with the sensitive species, to avoid contact with desirable species and to target only noxious weeds. Spot-spraying will be accomplished in most instances with application by backpack sprayer or four-wheeler sprayer.

Weed Control Methods

Prevention, early detection through monitoring, and control of weed species are practical means of vegetation management to achieve the habitat goals of the delta project area. Initial control of noxious weeds is integral to the success of the delta project and will likely require a combination of control techniques. This section provides a general review of the available weed control methods. This plan will be updated to incorporate new techniques as they are developed. Control methods consist of physical, cultural, biological and chemical control and a combination of these methods.

Noxious Weed Control for Target Species

Tamarisk

Cut Stump. Cut stump methods require individual trees to be removed near the base with a chain saw leaving a cut stump to be treated with herbicide application. This method leaves the root crown, which will likely resprout even following treatment. The treatment creates less soil disturbance than mechanical removal, but requires intense follow-up maintenance. The cut stump method should be used in areas where tamarisk trees are growing among native tree stands as a method to ensure that native plant material is preserved.

Mechanical Removal. Mechanical removal requires heavy equipment to remove the entire tree biomass, including the root crown. This is the most desirable removal method for large monocultures of tamarisk. All removed material/slash must be mulched at a minimum and preferably burned. The area must be raked to remove any scattered root material, which will easily root and resprout. This method often creates extensive soil disturbance and is not recommended for use in areas where tamarisk is not dominant or sensitive native vegetation is present. All mechanical removal areas will be seeded with the appropriate mix according to site conditions, and follow-up herbicide applications will be necessary.

Russian Olive

Frill Cuts and Cut Stump. Frill cutting is a control method for Russian olive requiring multiple layered cuts into the bark of the tree where herbicide is applied. This ensures delivery of the herbicide into the root system and should result in tree mortality. Frill cuts leave the upper biomass behind, which may contain seed material that will need to be removed the following growing season. Frill cutting and cut stump may be appropriate for isolated trees within native vegetation stands and small Russian olive stands. This method will require follow-up treatment of stumps as Russian olive will continue to sprout from treated material.

Mowing. Mowing is an effective control method for new infestations of seedlings and saplings less than 1 inch in diameter. Seedlings and saplings should be cut with a mower, followed with application of herbicide to the stumps. This control method should be repeated on an annual basis to address any new growth from seed stock in the area.

Mechanical Removal See tamarisk removal strategies.

Russian Knapweed

Russian knapweed control requires a multiphased approach of herbicide treatment, mowing, and disking. New infestations and vegetative regrowth of old infestations should be treated with foliar herbicide in the late spring/early summer as knapweed emerges. Following complete desiccation of the vegetative plant material, infested areas should be mowed and all plant material removed from the site. Disking must take place in the early fall to break up knapweed root material and prepare the site for revegetation. Revegetation of knapweed-infested areas will occur in the fall with seeding of native sod-forming grass, such as western wheatgrass. This is imperative to establishing a dominant ground cover prior to the spring to out compete any knapweed seed stock remaining in the soil.

Phragmites

As previously mentioned phragmites is currently being treated on a large scale within and adjacent to the study area. Efforts will be made to continue treatment consistent with the current methods being used.

Current research on phragmites control at Utah State University is evaluating 5 different treatment regimes that are reasonable for small (quarter acre) patches. Many of these could be used to treat larger areas. One year after initial treatments, the best results have been observed from a summer mow, and a fall glyphosate treatment. This treatment regime seems to be most effective at reducing the regrowth of phragmites the next year, and allowing for native species return. The challenge with this treatment is that mowers may get stuck during the summer mow period, when the water levels are still quite high, so equipment can make a difference. (Christine Rohal, pers. comm. USU, email July 6, 2013).

Three other spray treatments included in this research are: summer glyphosate spray with a winter mow, summer imazapyr spray with a winter mow, and fall glyphosate spray with a winter mow. All

three of these treatments were fairly effective at removing phragmites after the first year, with the imazapyr treatment looking slightly better. All three winter mows after these spray treatments left substantial amounts of litter, which is a big impediment to regrowth of native plants. The summer mow treatment seemed to have less litter, with a better chance for native species establishment (C. Rohal, USU, pers. comm.).

Soil Solarization This method is accomplished by placing a cover of plastic over the soil surface to increase the soil temperatures to kill plants, seeds, pathogens and insects. If the cover is opaque, it will block sunlight, stopping photosynthesis and kill the covered plants (TNC 2001). The technique is currently being tested against phragmites (Kettenring et al 2012) and may be effective on a small scale for new infestations post construction.

Flooding Where water control levels can be manipulated, flooding may be used to control some noxious weeds. This control method may not be feasible on the delta project area, as the water depths required to effectively treat weeds, e.g., ~ 5 feet taller than an entire stand of phragmites (OMNR 2011), would be difficult to achieve under the expected delta water regime and the Utah Lake levels. It may be possible to apply to newly emerging plants in the spring with shallower water depths (OMNR).

Quackgrass, Canada Thistle, Musk Thistle, Field Bindweed, and Houndstongue

Infestations of these species almost exclusively require herbicide application to control. However, mowing and tilling can be effective control methods for Canada thistle and musk thistle. Mowing, brush cutting and “weed eating” are more effective on annuals that are cut before they flower and set seed (TNC 2001). Some species re-sprout vigorously when cut, growing many more stems that can flower and set seed. Therefore the biology of the weed should be considered in areas where mowing and cutting are considered. It is important to collect plant fragments of species capable of sprouting from stem or root segments to prevent them from washing or blowing into uninfested areas (TNC 2001).

Mulching Hay mulch has been used to control Canada thistle, using application several feet deep that reduced flowering rates (TNC 2001).

Tilling Tilling may be appropriate to use on areas that already have disturbed soils, such as construction sites. The best control is done when the soil remains dry, so the plant fragments do not resprout. Tilling should be done in 2 stages: a first tilling to turn over the soil and cut plant roots at 6” to 2’ depths and a second tilling to work up just the top 6” of soil to control weeds.

Grazing Grazing may be considered on a site specific basis as a weed control option. Grazing may either promote or reduce weed abundance and used alone will not likely eradicate a noxious weed (TNC 2001). The use of this control technique should be determined by the weed species present and other site specifics. A grazing plan should be developed that considers timing and duration, management of animals-including fencing and herding, and the precaution of moving animals to or from an infested area, as the animals may introduce noxious weed species to the controlled area. Of the weed species listed for the delta project area, grazing has been used as a control tool for dock (*Rumex* sp., TNC 2001).

Prescribed Burning Prescribed burning may be an option which can be effective with herbicide use, although it can be ineffective on some weed species. Considerations to be made before using this method are: timing, level of disturbance of area, weed seed introduction via equipment, public safety, and possible impacts to surrounding lands. Prescribed burns of reed canarygrass during the growing season, may give other desirable native species a competitive edge (TNC 2001). Burning phragmites removes leaf litter allowing other species to germinate. Burning in conjunction with herbicide has been found to be effective in its control (TNC 2001). Spot burning can be effective on small infestations, and cheaper and easier to implement than a prescribed burn. Any prescribed burns should be done in coordination with Utah State Lands and Utah County.

Cultural Control Cultural control in the context of this plan is predominantly the planting of desired vegetation to prevent the reestablishment of noxious weeds after other control techniques are used successfully. For example, live willow plantings were found to reduce total biomass of reed canarygrass on a sloping wetland edge (Kim et al, 2006). This technique may not be effective long term, but may present the best option in environmentally sensitive sites. Mowing, tilling and burning are considered to be cultural controls by other sources, but they are described under the mechanical control techniques in this Plan.

Chemical Control Chemical control of weeds is accomplished with the use of herbicides, which impact plant species through a variety of mechanisms. A complete list of herbicides currently approved for use by the Mitigation Commission for weed control is available in Table 1. The Commission has identified the appropriate herbicide for weed control by land or habitat type, ie., riparian, wetlands and ponds, or upland areas. In riparian areas, or wetlands, the most commonly used products contain glyphosate 2,4-D Amine, or imazapyr as the active ingredient. Herbicide use is restricted where surface water is present or below the high water mark unless the product is specific for control of plants in and around aquatic sites (eg., Rodeo, Commission 2012).

Glyphosate (N-(phosphonomethyl) glycine) is a broad spectrum nonselective systemic herbicide that kills or suppresses many grasses, forbs, vines shrubs and trees, and has been successful in phragmites and reed canarygrass control in preserves (TNC 2001). It is currently the most commonly used herbicide on Commission lands where noxious weed control is done in wetlands and near ponds (Commission 2013). Common formulations that are licensed or certified for use on or near water include: Rodeo, Aquamaster or Aqua neat. Label details for these and other herbicides are available in the Commission Integrated Pest Management Plan (Commission 2012). There are three herbicide products currently listed for use in wetland or pond areas in the Commission's IPMP: Glypro, Rodeo, and Wedar 64.

2,4-D Amine is a synthetic growth hormone that kills the target weed by mimicking a plant growth hormone, causing uncontrolled and disorganized plant growth leading to plant death (TNC 2001). It is effective on many broadleaf weeds, but has no effect on grasses. It may be used to the water's edge in wetland and pond areas from June to August, when weeds are actively growing. It is sprayed away from the water flow direction, so any drift that may reach the water surface is diluted to the maximum extent (see Wedar 64, Commission 2012).

Table 1. Herbicides included in the Mitigation Commission's Integrated Pest Management Plan.

Common Name	Active Ingredient (s)	Manufacturer	EPA Registration #
Aquamaster	Glyphosate	Monsanto	524-343
Arsenal	Isopropylamine Salt of Imazapyr	BASF Corp.	241-346
Banvel	Dicamba	Micro Flo Co.	66330-276
Credit	Glyphosate	Nufarm.	71368-65
Escort	Methylsulfuron methyl	DuPont	23005
Escort & Weedar 64	Methylsulfuron methyl & 2,4-D Amine	DuPont & Nufarm	23005 & 71368-1
Escort & Weedmaster	Methylsulfuron methyl & 2,4-D Amine plus Dicamba	DuPont	23005 & 71368-34
Garlon 4	Triclopyr	Dow	62719-40
Glypro	Glyphosate	Dow	62719-324
Milestone	Aminopyralid	Dow	62719-519
Oust XP & Plateau	Sulfometuron methyl & <u>Imazapic-ammonium</u>	Dupont & BASF Corp	352-601 & 241-365
Ramik Green Mini	Diphacinone	HACO Inc.	61282-48
Rodeo	Glyphosate	Monsanto	62719-324
Weedar 64	2,4-D Amine	Nufarm	71368-1
Weedar 64 & Banvel	2,4-D Amine & Dicamba	Nufarm & Micro Flo Co.	71368-1 & 66330-276
Weedmaster	2,4-D Amine plus Dicamba	BASF Corp.	71368-34

Imazapyr is marketed in compounds by the trade names of Arsenal and others. Imazapyr is a non-selective broad-spectrum systemic herbicide, absorbed by the foliage & roots, with rapid transfer to the meristematic regions, where it accumulates and causes disruption of protein synthesis. It is typically used to control grasses and woody species such as tamarisk. Herbicides containing imazapyr are listed for use in riparian and upland areas only in the Commission Integrated Pest Management Plan (Commission 2012). It is typically not sprayed on plants below the high water mark. It can be used as a fresh cut stump application on brush.

Herbicides are to be used in the project area with care and according to the Commission's Integrated Pest Management Plan (2012) and Pesticide Management Plan (revised 2013), when applied on or near waters of the State, under the Commission's General Permit. All applicators are to be state certified (Commission 2012). Procedures for stopping, containing and cleaning up leaks, spills and other releases of herbicides to waters of the state are included in the Commission's Revised Pesticide Management Plan (2013).

Integrated Methods As indicated in examples discussed in the above sections, a combination of control methods (physical, biological and chemical) are recommended for effective weed control that will have minimal long term impact on nontarget species.

The most effective control technique reported for reed canarygrass is a combination of glyphosate and disking or mowing treatments with a follow-up herbicide application during the next growing season (Kilbride and Pavaglio 1999).

Monitoring and Maintenance

Annual monitoring and follow up treatment of weeds where needed, will be completed within the project area. The goal of the monitoring is to document progress of vegetation management on the delta. Monitoring will be done through plant community survey, photographic documentation and inventory of wetlands. Monitoring sites will be established in areas affected by various project actions, such as dike/berm removal, removal of grazing, and channel construction, among others.

The plant community surveys will be conducted in August of each year and consist of the following information: relative cover of hydrophytic vegetation in each stratum (tree, shrub and herb); species richness in each stratum; dominant species in each stratum; relative cover of weedy species; soil stability; site hydrology; overall assessment of wetland sustainability; Area (% of site) dominated by hydrophytic vegetation; and wildlife use. A permanent transect formed by the longest axis of the monitoring site will be the basis of data collection. The location and number of transects may be adjusted to reflect the size and shape of each site and the variability encountered in each site.

The plant community survey data will be used to identify areas where intervention is needed. Corrective action can be initiated and site management recommendations, such as weed control activities, prescribed.

Photographic documentation will be conducted at recommended stations until success criteria are reached. Photos will be taken during each plant community survey in August. The photographs may be used to document the yearly variation over areas of the delta project and the wetland development progress.

While the plant community survey and photography will document the progress of wetland development and provide information with which to manage the area, the Mitigation Commission proposes that wetland delineation serve as the final measure of the project success. The Mitigation Commission will conduct a delineation of areas where hydrologic conditions have been sufficient to support a prevalence of hydrophytic vegetation once construction is substantially complete.

The extent of wetlands within the project area will be determined utilizing aerial photo interpretation, data that may be available from other sources (e.g. soil survey information, previous wetland delineations and NWI maps), and field reconnaissance. Wetland delineations will be mapped (digitized

from orthophoto maps) using the ArcView GIS. In addition, data layers to be imported into the GIS include the present extent of jurisdictional wetlands and areas of proposed wetland creation, enhancement, conversion and temporary impact. The results of this monitoring effort will be included in subsequent annual reports.

Any additional permit-related monitoring requirements, eg., Army Corps of Engineers 404 permitting, or State Division of Water Quality UPDES General permit No UTG170000 for pesticide use (such as acres along waters of the state treated with herbicides/year) will be implemented within the delta project area as well.

Maintenance weed control activities will be coordinated with other Utah Lake efforts by the Utah Lake Commission, Utah State Lands Division and Utah County Public Works.

Reports and Data Management

Data will be recorded on standardized field forms and maintained in Mitigation Commission files. Reports will be written annually and maintained by the Mitigation Commission or other JSRIP entity responsible for management. These will serve as the basis for future management activities and planning for the delta project area.

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PROVO RIVER DELTA RESTORATION PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT

Appendix C: Mosquito Management Plan

**Mosquito Management Plan
for the Proposed
Provo River Delta Restoration
Project**

**Utah Reclamation Mitigation and
Conservation Commission
2013**

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Introduction

The Provo River Delta Restoration Project is a multi-agency effort proposed to restore the Provo River delta at Utah Lake. The proposed project would restore historical habitat in the lower Provo River that is essential for spawning, hatching, larval transport, survival, rearing and recruitment of the June sucker population on a self-sustaining basis. The proposed project would include releasing the Provo River from its current channelized location and allowing it to flow to the north, where a delta ecosystem would be restored to provide the diverse habitat required for June sucker recovery. This action is being undertaken specifically to address the problem of lack of natural recruitment by June sucker, an endangered fish species, in Utah Lake. It responds directly to requirements of the June Sucker Recovery Plan (USFWS 1999) and the June Sucker Recovery Implementation Program (JSRIP) (USFWS 2002).

Alternatives proposed for consideration are all located in the study area (Figure 1); which is generally north of the existing Provo River channel and west of 3100 West in Utah County, Utah.

Lands in the study area are already capable of producing significant numbers of mosquitoes, and abatement efforts are currently implemented in the study area. However, any of the three action alternatives would increase the size and duration of shallow water areas capable of producing mosquitos. The Joint Lead Agencies (made up of the Department of the Interior, Utah Reclamation Mitigation and Conservation Commission and the Central Utah Water Conservancy District), have committed to mitigate for the increased mosquito breeding habitat and associated increased risk of mosquito borne disease by developing and implementing a Mosquito Management Plan. Under the plan, potential mosquito producing habitat within the project boundary would be monitored and treated with larvicide. Currently, mosquito producing habitat within the project area is monitored and treated by the Utah County Health Department.

The Provo River Delta Restoration Project (PRDRP) area is located in the Provo Orem Mosquito District of Utah County (Figure 2). The Utah County Health Department uses an integrated pest management (IPM) approach to mosquito control. This approach includes weekly monitoring, species identification, action thresholds for treatment, biological control, larval and adult mosquito control with pesticides. Even though the project will result in an increase in potential mosquito producing habitat, implementation of the Mosquito Management Plan should reduce the risk of mosquito borne disease to pre-PRDRP Project levels, or lower.

Objectives There are three important objectives that are addressed by this Mosquito Management Plan. The principal objective is to formally address mosquito borne disease, including West Nile Virus, and its associated public health threat to communities on or adjacent to the Project Area. The second objective is to develop and implement a mosquito management plan that includes Integrated Pest Management, social and environmentally responsible management controls and comprehensive data management.

And the final objective is to develop and implement an Outreach and Education protocol within the scope of this Mosquito Management Plan.

Implementation of the Mosquito Management Plan consists of three primary components. All three components are to be implemented concurrently but at varying levels of intensity, depending upon the time of the year, threat levels and other factors. The three components are

- **Larval Mosquito Monitoring and Control,**
- **Adult Mosquito Monitoring and Control, and**
- **Communication and Education.**

The proposed cooperative approach to mosquito management associated with the Provo River Delta Restoration Project would be implemented as follows:

1. Larval monitoring and control: Responsibility of PRDRP Project, in consultation with Utah County Health Department
2. Adult Mosquito Monitoring and Control: Responsibility of Utah County Health Department with cooperation and assistance from PRDRP Project
3. Communication and Education: Cooperative effort among PRDRP Project, Utah County Health Department, and others.

The Mitigation Commission conducts mosquito control on mitigation properties under the auspices of the Utah Pollution Discharge Elimination System (UPDES) general permit number UTG170000, administered by the Utah Division of Water Quality, Department of Environmental Quality. This Mosquito Management Plan has been developed in coordination with the Commission's 2012 Pesticide Management Plan (Mitigation Commission 2012) as required under the UPDES permit.

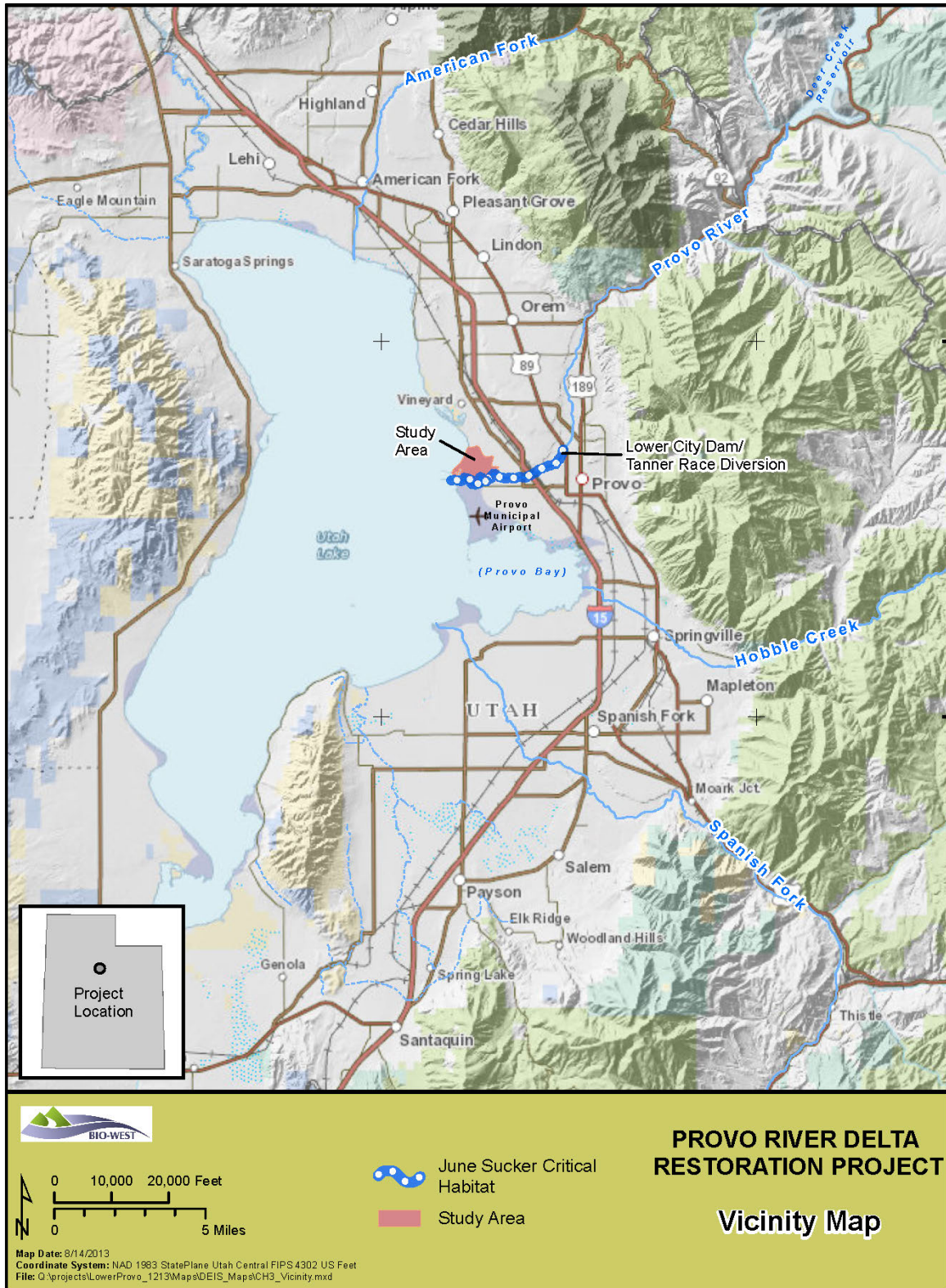


Figure 1. Study area location in Utah County, Utah.

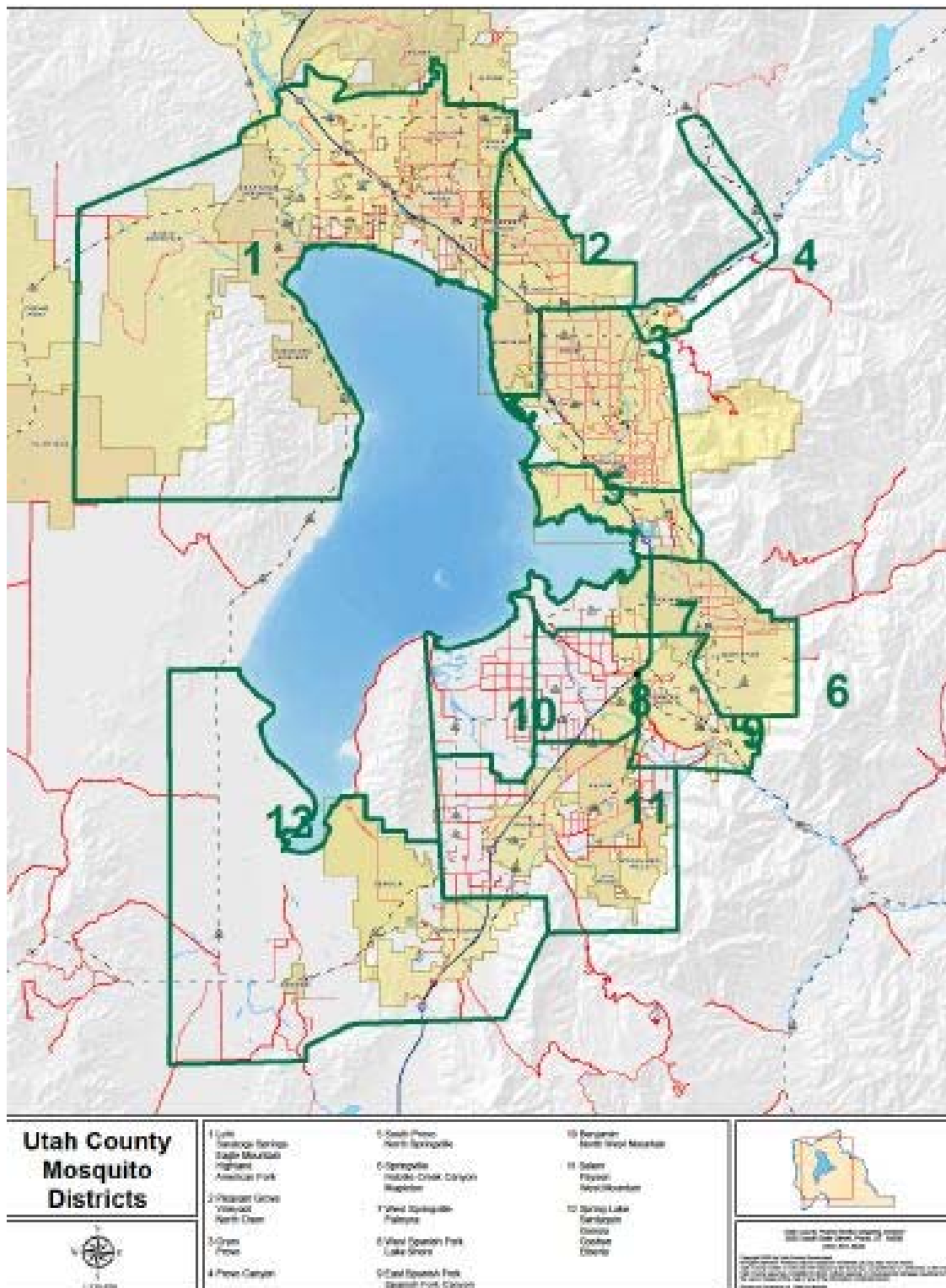


Figure 2. Utah County Mosquito Districts, from the Utah County Larval Mosquito Control Document (Source: www.utahcountyonline.org).

Background

Mosquito management has increasingly become a significant concern regarding social welfare, agricultural industry and natural resource management. Of particular concern is mosquito borne illness. The presence of mosquito transmitted disease throughout Utah has incited social anxiety and initiated a public appeal for increased control and management of mosquito populations. There are three species of mosquitoes that are known to effectively transmit disease, namely Arboviruses, to humans: *Culex tarsalis*, *Culex pipiens* and *Culex erythrothorax*. The third species, *erythrothorax*, more commonly bites birds and has been found to be infected with the West Nile Virus (WNV, Phillips and Christensen, 2006). WNV and Encephalitis are Arboviruses that are transmitted mainly by mosquitoes and produce a significant threat to human health. Utah County has had WNV-positive mosquito samples for all three *Culex* species, mostly *tarsalis*, some *pipiens* and *erthyrothorax* (R. Mower, Utah County Health Department, personal comment).

In an effort to address, control and manage this threat, the Commission has developed this Mosquito Management Plan. The Mosquito Management Plan is intended to be a living document and although developed specifically for the Provo River Delta Restoration Project, it was also developed with the anticipation of a County-wide, cooperative management approach. Consideration will be made to incorporate any coordinated cooperation, consultation, technical assistance and training from local and/or county Departments of Health or Mosquito Abatement Districts (MAD). Mosquito control on the Delta Restoration Project will be implemented using an Integrated Pest Management (IPM) model that is consistent with mosquito control measures recommended by the U.S. Centers for Disease Control (CDC). According to the CDC,

“Prevention and control of arboviral diseases is accomplished most effectively through a comprehensive, integrated mosquito management program using sound integrated pest management (IPM) principles. IPM is based on an understanding of the underlying biology of the transmission system, and utilizes regular monitoring to determine if and when interventions are needed to keep pest numbers below levels at which intolerable levels of damage, annoyance, or disease occur. IPM-based systems employ a variety of physical, mechanical, cultural, biological and educational measures, singly or in appropriate combination, to attain the desired pest population control.” (CDC 2003, p.27).

In addition, the CDC recommends that mosquito control plans include each of the following:

- Ecological Monitoring/Surveillance of mosquitoes and intermediate hosts.
- Physical, Chemical and Biological control measures.
- Public Education and Outreach development, including personal protection information.
- Emergency West Nile Virus (WNV) Management using a Phased Control Approach.

The Mosquito Management Plan addresses each of these recommended plan elements and details how they will be implemented.

Mosquito Biology

Mosquitoes develop through four stages in their life cycle (see Figure 3). Appropriate mosquito control methods vary according to mosquito life cycle stage. The diagram below (Figure 3) shows how each of the WNV control methods would be used as part of an IPM approach. The life cycle details are adapted from Clements (2000), Knight et al. (2003) and Marra et al. (2004). The diagram is from AMCA (2005).

Eggs All mosquitoes must develop in water before they can fly. The adult female mosquito, after taking a blood meal, will search for a place to lay her eggs. *Culex* mosquitoes lay eggs in clusters, also called egg rafts, on the water's surface. *C. tarsalis* lay eggs in rafts on the surface of permanent and semi-permanent clear ground pools, springs, and ditches. In late summer, they also lay eggs in temporary pools and containers that contain standing water. *C. pipiens* use standing or slow-moving water that contains decaying organic materials to lay their eggs. *C. erthrothorax* develop in deeper water with heavy vegetation, such as Phragmites.

Larvae Larvae develop in shallow water. They have four growth stages known as instars. They are found in the water hanging head down just below the surface because the larvae breathe through a respiratory siphon at the tail end of their body that breaks the surface of the water. Larvae grow to be approximately 0.5 inch long by the fourth instar.

The larvae of *C. tarsalis* and *C. pipiens* are found in somewhat different habitats. *C. tarsalis* larvae are found in a wide variety of semi-permanent and permanent sources of water in both rural and urban areas. They occupy a wide variety of either fresh or polluted water habitats, usually in open, sunlit locations. In contrast, *C. pipiens* larvae are found in a wide variety of natural and artificial sources of water that often are highly polluted with organic wastes. They have been found in containers of various types, catch basins, ornamental pools, cesspools, swimming pools that are not completely drained, ditches, and tree holes.

Pupae At the end of the fourth instar, the larva molts into a pupa. The pupa is a cocoon-like stage when the adult mosquito is forming. This stage typically lasts about 2 days; however, the amount of time spent in the pupa may vary depending on water's temperature. The mosquito does not feed during the pupa stage, but when disturbed, will tumble as it avoids danger.

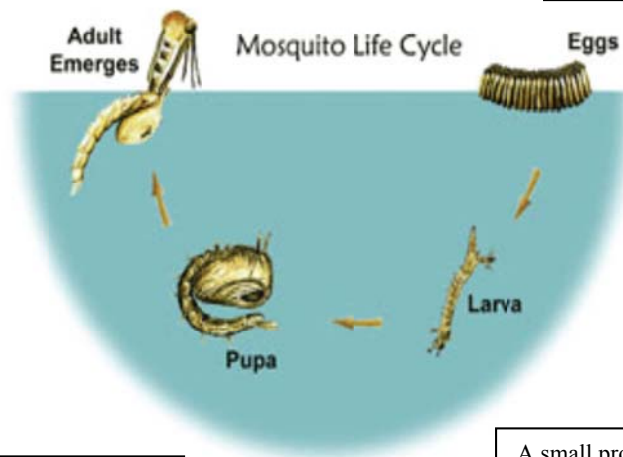
Adult When the adult is fully formed, it breaks through and emerges from the pupal skin. It rests for a short time on the water surface while its wings expand and dry. Male mosquitoes usually emerge first and form a swarm where they will mate with females as they emerge from their pupae. Females mate only once and store sperm in their bodies to fertilize their eggs as they are laid. Once the female has mated, she flies off in search of a blood meal to obtain the proteins necessary for laying eggs. Males and females feed on plant nectar for energy.

Adult flying mosquitoes can be separated into two types based on their sex: male mosquitoes which do not bite, tend to swarm or fly in large mosquito groups and feed only on flower nectar, and female mosquitoes which do bite and seek a blood meal for egg laying. Personal protection and adulticiding are used at this life cycle stage.



Female mosquitoes lay eggs in “rafts” of up to 200 eggs stuck together. Eggs are laid on the surface of standing water with depths typically between 4-12”. Physical control measures and mosquito predation target this life cycle stage. *Culex tarsalis* eggs do not overwinter.

Pupa’s metamorphasize into adults. The adults emerge to the water surface and rests until its body can dry and harden.



Larvae change into pupae which is a resting stage. Physical control methods that disrupt the life cycle target this stage.

A small proportion of the eggs hatch into larvae, typically less than one percent. Larvae develop in permanent water and feed on organic debris. Larvae must come to the surface at frequent intervals to obtain oxygen through a breathing tube. During growth the larva sheds its skin four times with the stages between molts called instars. Larvicides target this life cycle stage and work by preventing the larvae from obtaining oxygen at the water surface, by affecting food intake or by preventing the ability to transform into the next life cycle stage. Physical control methods that disrupt the life cycle and mosquito predation also target this stage.

Figure 3. Mosquito control methods in relation to the *Culex tarsalis* life cycle.

A number of factors influence the blood feeding of the adult female. They include humidity, wind, temperature, light, and animal emanations (such as respiration or body heat). For most mosquitoes, the primary period for feeding on blood is between sunset and midnight (generally between 9 pm and midnight in Utah County) during the summer. A minimal feeding period may occur in the morning, mostly with *Ochlerotatus increpitus*, some *Ochlerotatus dorsalis*, both nuisance mosquitoes, in June. Rotator trap data for Utah County has indicated that this feeding peak is very low. This feeding behavior may change during the spring and fall, when daytime conditions favor mosquito activity over evening conditions. Temperatures above 55 degrees F and humidity levels at or in excess of 70 percent are optimum feeding conditions.

Mosquitoes of the genus *Culex* can overwinter as gravid (egg bearing) females. This characteristic results in populations that are low in numbers in the spring but peak in Utah County during late July and early August (July 24-1st week of August). Because the populations of mosquitoes increase greatly late in the summer, potential vectors and disease transmission are most prevalent at this time.

C. tarsalis breeds several generations per year. Females overwinter in protected places, including caves, abandoned mines, and cellars. Adults prefer to feed on birds, but will bite humans and other mammals. Feeding occurs near dusk and after dark. Its life cycle varies from 4 days to 30 days, depending on conditions. *C. tarsalis* commonly travels up to 2 miles for a blood meal. Collections have been made at elevations up to 10,000 feet.

C. pipiens females hibernate in cellars, basements, and other protected sites. Birds are the major hosts of *C. pipiens* because it takes blood meals from them more than 95 percent of the time. Mammals constitute the rest, with humans representing less than 1 percent of the total.

C. tarsalis is probably the main carrier of WNV because of its affinity to take blood meals from birds. At least 120 bird species and eight mammal species have been infected. Corvids (crows, magpies, ravens, and jays) seem to be affected more than other species; however, because many corvids die when infected, they are not an ideal host for the virus. Other species, such as house sparrows, do not seem to die as readily when infected and are therefore a more effective host for the virus.

C. erthrocerus - This species develops in deeper water of heavy vegetation. Larvae usually overwinter and adults are common from July-mid Sept; their populations peak in late summer, August to early September. They can be aggressive biters in late afternoon to early evening particularly when disturbing vegetation in this habitat. .

Ochlerotatus increpitus , a nuisance mosquito, is a late spring species that breeds in trapped waters created by Utah Lake level fluctuations, along the edges of the phragmites stands. This mosquito, and evening biter, peaks in late spring and is usually gone by early July.

Larval Habitat Mosquitoes successfully inhabit almost every kind of collection of water. A breeding site can be any place that will hold water for a week or more after rainfall. Prime breeding sites include marsh edges, short-grass ditches, tire ruts, hoof prints, discarded tires left outdoors, poorly maintained bird baths, holes in trees, clogged rain gutters, unused swimming and plastic wading pools, and pots and pans with standing water, and many other habitats that will hold stagnant water. The most prolific breeding sites in the city are probably flood-irrigated lands, and seasonally wet/dry locations when stagnant water is present.

Some areas that do not support mosquitoes include moving water (rivers, streams, and creeks), deeper lakes, and duck ponds. Other conditions that are unfavorable for breeding of mosquitoes are turbulence and the presence of natural predators.

Adult Habitat In the daytime, adult mosquitoes avoid adverse environmental conditions, such as intense heat, by taking refuge in resting areas known as “harborage sites”. Typically, these resting areas are composed of natural vegetation, including forests, tree stands, grass, shrubs, or other foliage. Ideal resting areas are generally shaded with cooler daytime temperatures and high relative humidity. These conditions are typically found in forests or tree stands that have a canopy, and dense underbrush. Wetlands also may be present nearby. Other resting sites include culverts, hollow logs, areas underneath decks, shaded sides of buildings, basements, and garages.

West Nile Virus West Nile Virus was first observed in Africa in 1937. Its primary mode of transportation is through birds over long distances, and mosquitoes. The first discovery of West Nile Virus in the United States was in New York State in 1999. After that time, the disease continued to move across the United States. By August 2003, the virus had crossed the continental divide and established in Utah. Since 2003, the number of WNV human cases in Utah has peaked at 158 in 2006. Of these, 65 occurred in Utah County. Since then, Utah County has reported 2 human cases in 2007, 1 in 2008 and none during the 2009-2012 period (www.utahcountyonline.org May, 2012).

Integrated Pest Management This Mosquito Management Plan has been developed using an IPM model that will provide direction for managing pest and nuisance problems including weeds, insects, and animals on public lands. IPM is a science-based, common-sense approach for managing insects, rodents, or other vectors. IPM uses a variety of pest management techniques that focus on pest prevention, pest reduction, and the elimination of conditions that lead to pest infestations. IPM manages pests and disease vectors by managing the environment to eliminate their food, water, and shelter. For IPM to succeed, environmental health specialists must take into account the behavior and ecology of the target pest, the environment in which it is active, changes that occur in the environment, and the activities of people who share the environment.

Although IPM includes some standard pest control techniques, the four components of IPM add to them. Those four components are

- **Inspection:** examination of indoor and outdoor areas to identify what, where, and why pests are active. A major inspection is done at the start of an IPM program; minor inspections occur throughout an IPM program.
- **Monitoring:** verification of pest presence or absence. Monitoring includes direct observation of pests; and collection of pests in traps.
- **Treatment:** corrective actions or interventions to reduce the number of pests. Education to change people's behavior is the most important part of an effective IPM program. Cleaning, sanitation, and keeping pests out are effective over the long term.
- **Evaluation:** follow-up to determine whether treatments are successful and what should be done next. Evaluation is one of the most critical components of an IPM plan.

Control Methods

Physical Methods

There are a number of physical measures that can be used to physically modify/reduce mosquito breeding habitat in or near wetlands. The CDC recommends two general source reduction types: (1) sanitation or cleaning of human by-products that can contribute to mosquito habitat, and (2) water management. Specific measures that may assist in wetland source reduction include:

- Increasing interspersed of open water with emergent marsh which allows greater access for mosquito control and reduces breeding/hiding habitat
- Increasing open water depth and incorporation of plant-free zones which provide habitat for predacious aquatic insects and salamander larvae
- Restoration of a healthy aquatic food chain
- Use of a flow-through system. "The flow of water through a wetland (and its related volumetric turnover rate) will help reduce mosquito production ... not by flushing out the larvae *per se*, but rather through helping to eliminate the accumulation of stagnant, organically-rich waters that attract standing water mosquitoes such as *Culex*, and to maintain good water quality (e.g., high oxygen levels, removal of toxic metabolites) to ensure survival of mosquito-larvae predators." (Meredith and Walton 2005).
- Improving water quality as there are numerous correlations between increased mosquito production and poor water quality, especially water high in organic material, low in DO, high temperatures; additionally, the effect of larvicides on mosquitoes can be reduced in areas of low water quality

- Site selection “Sites with a pre-existing land use that is favorable for mosquito production should be ranked higher for selection [for wetlands] than sites without existing mosquito problems. ... This will result in the lowest net effect of the project on increasing mosquito populations” (Knight et al 2003).
- Manipulation of mosquito habitats involves water management strategies to eliminate mosquito breeding areas and can include activities such as filling in or improving drainage in certain areas, or pumping water out of low-lying areas. Manipulation can permanently change the function of the mosquito habitat and can severely affect the ecological integrity of the wetland ecosystem.

Chemical Methods

The application of pesticides, such as those listed below, is one of the treatment methods for larval and adult mosquito control. It is believed that pesticide treatment helps contain and minimize the threat of WNV infection in humans. Adverse impacts to areas being treated will be minimized by applying pesticides at the recommended concentrations. The most commonly used pesticides include:

- Bacterial toxins such as Bti, which are ingested by mosquito larvae and are specific to mosquito larvae. The documented threats of WNV infecting residents outweigh the impacts of this bacterium on the areas where it would be used.
- Mosquitodal oils such as Golden Bear or Agnique, which kill larvae by interfering with their air intake at the water surface; these oils generally volatilize within 48 hours.
- Insect juvenile growth hormones such as methoprene, which prevent larvae from molting into adults
- Organophosphates such as Temephos, affect the central nervous system.
- Permethrin is an adulticide that acts on the insect nervous system, causing muscles to spasm, resulting in paralysis and death.
- Malathion and Naled are organophosphate adulticides that also act on the nervous system, resulting in overstimulation of the nervous system.

See Appendix B for product details. Pesticides will be applied in accordance with recommendations of the manufacturer. Treatment areas will be monitored to evaluate the efficacy of control operations.

Bti

Bti is a microbial insecticide formulated for use to control mosquito larvae in aquatic habitats. The product is manufactured as corncob granules and is applied by hand or by

using hand-held seeders (spreaders) and power spreaders. Bti is an augmentative biological control agent formed from bacterium (*Bacillus thuringiensis*) that occurs naturally in soils. The bacterium produces protein crystal protoxins during the formation of spores that disrupt bodily functions in some insects. The active ingredient of Bti is called a crystalline delta-endotoxin. Live bacteria are not contained in Bti, the active ingredient is separated from the bacteria that are killed in a laboratory. When ingested by the mosquito larvae, the protoxins dissolve in the intestine and the delta-endotoxin reacts with the stomach secretions. The cells in the gut then become paralyzed, interfering with normal digestion and triggering the insect to stop feeding. Death typically occurs within a few hours of ingestion.

Bti adversely affects larval stages of species in the Order Diptera, Suborder Nematocera, Family Culicidae (mosquitoes). Research and field experiments have shown that Bti has no toxic effects on beneficial and predacious arthropods or insects such as honeybees, beetles, mayflies, dragonflies, damselflies, stoneflies, caddisflies and true bugs. In addition, Diptera (true flies and midges) *Chaoborus* species, *Ephydra riparia*, *Musca domestica*, *Odontomyia* species, and *Polypedilum* species demonstrated no susceptibility to Bti. It has been determined that variable mortality did occur among *Chrironomus pulmosus*, *Chrironomus stigmaterus*, *Dixa* species, *Goeldchironomus holoprasinus* and *Palpomyia* species. Low levels of toxicity were also observed among a few species of butterflies and moths, but no toxic effects occurred in crustaceans or amphibians. (Lacey and Merritt, 2003)

Using Bti to control larval mosquitoes offers several advantages. First, its residual lasts only 24 hours in water, and it breaks down rapidly as a result of exposure to ultraviolet light. Second, it does not affect nontarget vertebrate species, such as fish and birds. Third, the bacterium kills the mosquito larvae, which can be observed the same day of application. A negative effect is that part of the food chain is temporarily removed by killing the larvae and possibly other dipterans, potentially affecting predators by removing a source of food. However, because Bti does not last long in water, adult mosquitoes and other dipterans could lay eggs in the treated water 24 hours after a treatment, and larvae could develop to provide another source of food to predators. Treatments are usually made after the larvae have been available to predators for up to two days of the normal four to five day larval stage. The usual application rate used for Bti is 5 pounds/acre or 0.2 acres treated per 1.0 pound of Bti.

Bacillus sphaericus

Bacillus sphaericus (Bs) is a bacterium that occurs naturally in soil and contains protein crystals and living spores with larvicidal abilities similar to Bti. The toxin is active only against the feeding larval stages and must be partially digested before it becomes activated. During digestion, larval enzymes dissolve the crystals into protoxins, which are smaller crystals. These protoxins then paralyze the gut and break through pores in the gut wall within a few hours to invade the body cavity and multiply. The mosquito larvae will die within 48 to 72 hours allowing predators a minimum of 2 days of the normal 4 to 5 day predation window.

Bs adversely affects larval stages of insect species in the Order Diptera, Suborder Nematocera, Family Culicidae. Bs is specific in causing mortality to mosquito larvae. *Culex* species are the most sensitive to Bs. In contrast to Bti, Bs is virtually non-toxic to black flies. Mammals and other non-target species are unaffected by applications of Bs.

Bs is similar to Bti in that it is a bacterium, but the differences are significant. Bs kills the mosquito larvae, and results may be observed within two days of treatment. Bs also has demonstrated efficacy in controlling mosquito larvae in highly organic aquatic environments, including sewage-waste lagoons and septic ditches.

The residual time for Bs in water is 2 to 4 weeks before retreatment is necessary. Bs has the ability to release fresh spores into the water column and recycle itself offering residual control, but also having extended effects to nontarget organisms. Mosquitoes have been shown to develop resistance to Bs, which reduces its effectiveness. Eggs that are laid within 4 weeks of treatment still have the potential to be affected by Bs, causing a break in the food chain that lasts longer than with Bti.

Methoprene

Methoprene is a hormonal insect growth regulator (IGR), not a bacterium. However, it does not immediately kill the mosquito larvae. The IGR is a copy of the juvenile hormone in the mosquito. The hormone prevents complete metamorphosis by disrupting the molting process and does not allow the larvae to develop into an adult causing the mosquito to die at the pupa stage. Methoprene allows the larvae to remain in the food chain, but prevents the emergence of adult mosquitoes that bite and breed. The methoprene is added to the water and absorbed through the larval exoskeleton.

Use of methoprene in wetlands poses two identified potential impacts. First, it affects more nontarget species including fish and aquatic invertebrates. Second, the residual time for methoprene in water varies depending on the form of the product used: 21 days (sand), 30 days (pellet), or 150 days (briquette). This long residual time may pose a risk to the biological function of wetlands.

Synthetic Pyrethroids

These products cause rapid knockdown of adult mosquitoes and are typically mixed with a synergist compound, such as piperonyl butoxide, which enhances the effectiveness of the active ingredient. They exhibit low mammalian toxicity, degrade rapidly in sunlight, leave little or no residue, and do not bioaccumulate in the environment. Dosage rates can be low to control mosquitoes. These products are applied in small quantities per acre, referred to as ultra-low volume (ULV) application. ULV delivery techniques minimize environmental impacts at the same time they effectively manage populations of adult mosquitoes. Synthetic pyrethroids are effective in killing mosquitoes, gnats, biting and non-biting midges, black flies, and other biting flies. These insecticides readily bind to soil and other organic particles; however, they are degraded by sunlight in water and on soil surfaces.

According to the EPA, pyrethroids can be used for public health mosquito control programs without posing unreasonable risks to human health when applied according to the label. However, they are considered to pose slight risks of acute toxicity to humans, and at high doses, pyrethroids can affect the nervous system. According to the CDC, people who are concerned about exposure to a pesticide, such as those with chemical sensitivity or breathing conditions such as asthma can reduce their potential for exposure by staying indoors during the application period (typically nighttime). Pyrethroids are extremely toxic to aquatic organisms; however, recommended manufacturer dosage rates control the toxicity of these products to non-target species. Lobster, shrimp, mayfly nymphs, and zooplankton are the most susceptible non-target aquatic organisms. Some permethrin based mosquito control products direct the user not to apply the product within 100 feet of lakes or streams. This restriction or “buffer zone” was put on many permethrin labels out of concern for aquatic toxicity that might result due to runoff from agricultural sites, not as a result of an assessment of risks associated with the significantly lower concentrations of the active ingredient involved in ULV mosquito control applications. Resmethrin product labels state “Avoid direct application over lakes, ponds and streams” (emphasis added), but the same labels state that vegetation “around stagnant pools, marshy areas, ponds and shorelines may be treated” and there is no buffer zone requirement.

Oils or Monomolecular Surface Films

The application of oils to water is not species specific; however, products containing mineral oil such as Bonide Oil or Golden Bear Oil, or a monomolecular surface film such as Agnique have been used to control mosquitoes. Oils or surface films are used to mainly treat mosquitoes in the pupal stage. Gilled aquatic insects are apparently not affected by oil treatments, but they are lethal to most surface-breathing aquatic insects or those that depend on a breathing tube. The oil causes them to suffocate. The monomolecular surface films are effective by reducing surface tension on the water, which prevents larvae or pupae from hanging from the surface. This action causes them to drown. There is also the potential for flying insects that land on the water to be impacted, but this has not been studied comprehensively.

The U.S. Environmental Protection Agency’s (EPA) Office of Pesticide Programs is responsible for ensuring that a pesticide will not pose unreasonable adverse effects to human health and the environment. To prevent and minimize the impacts of pesticides on fish, wildlife and plants, the U.S. Fish and Wildlife Service provides technical assistance and consults with the EPA during registration and re-registration of pesticides.

Biological Methods

Biological control, or Biocontrol, is the use of other organisms to control mosquitoes. There is no known effective biological control for adult mosquitoes, so mosquito Biocontrol focuses on larval mosquitoes.

Predatory Aquatic Organisms

Predatory aquatic organisms may be introduced to reduce larval mosquito levels or to promote habitat development to sustain natural predators. Because of the potential

adverse effects of some nonnative predatory fish on native fish, the use of introduced fishes for Biocontrol is not always feasible. However, development of habitat for native predatory invertebrates and vertebrates may be employed.

Larval Mosquito Monitoring and Control

As stated in the introduction, the proposed approach for larval monitoring and control will be the responsibility of PRDRP Project, in consultation with Utah County Health Department. The focus of this component of the plan is to treat the problem at its source, which is breeding mosquito habitat.

In Utah, *Culex tarsalis* and *Culex pipiens* mosquitoes are the primary contributors of WNV to humans. *Culex erythothorax*, while more commonly known to take blood meals from birds, will also bite humans, and has been found to carry WNV. All potential mosquito habitats do not necessarily possess breeding mosquitoes and further, not all habitats that breed mosquito larvae produce *Culex*. Therefore, it is proposed to differentiate between habitats and focus surveillance efforts at the sites where *Culex* mosquitoes have historically occurred and/or where *Culex* mosquitoes are more likely to occur during the mosquito breeding season. *Ochleratatus increpitus* is best identified in the laboratory. Potential mosquito habitats are categorized as follows:

Category I - Vector larval breeding sites: All sites where *Culex* larvae have been found breeding

Category II – Non-vector larval breeding sites: All sites where only nuisance mosquito larvae have been found breeding

Category III - Potential larval breeding sites: All potential mosquito breeding sites that have not been found breeding any type of mosquitoes¹

The breeding sites have been mapped as shown on Figure 1. This map will be updated at least annually in coordination with the Utah County Health Department.

The primary focus of mosquito larvae control is for the genus *Culex*, the WNV vector. Other nuisance mosquitoes such as *Ochleratatus increpitus* that inhabit the same habitats will be controlled when *Culex* are.

Category I sites will be monitored once per week in accordance with the Larval Mosquito Monitoring Schedule (Table 1) and the larval monitoring protocol described later in this document. Larval control measures at a particular site will be initiated only if *Culex* are identified at that site.

¹ For the first year of monitoring, Category I sites are defined as areas mapped as potential *Culex* breeding sites, Category II sites are areas identified as potential non-*Culex* breeding sites. Category II and III sites shall be reclassified to Category I as during the course of the first field season and all-sites will be reclassified as appropriate at the conclusion of the first field season.

Category II sites will be monitored once per week in accordance with the Larval Mosquito Monitoring Schedule and the larval monitoring protocol. If *Culex* are identified at a site, the site will be reclassified as a **Category I** site, and Larval control measures will be initiated.

Category III will be monitored once during the peak season as a measure of quality control. Since climate can be a large contributor to seasonal *Culex* habitat trends, seasonal temperature and precipitation patterns will also help determine the timing at which **Category III** sites will be monitored. If larval mosquitoes are found, the site will be reclassified as appropriate. Monitoring at a site may be discontinued if the site is dry and not reinitiated until breeding again becomes viable.

Table 1. Larval Mosquito Monitoring Schedule					
	May	June	July	August	September
Category I	X	X	X	X	X
Category II		X	X	X	
Category III			X		

This Mosquito Management Plan is designed for maximized vector control, as pre-peak and post-peak season *Culex* larval control will likely reduce *Culex* adults from emerging later in the season or even the following year (*Culex* can overwinter). Monitoring and control in Category II sites during the heightened *Culex* breeding period and in Category III sites during peak *Culex* activity (as particular precipitation and temperature conditions could produce sites hospitable to *Culex* in places where they have not yet been observed) will further enhance WNV prevention, early detection and quality control as a measure of success in detecting fluctuating sources for *Culex*.

Methods

Water will be collected from each site, typically using a plastic dipper cup with a 3-foot wooden handle. Each sample (dip) will be examined for mosquito larvae presence. If mosquito larvae are present, an eyedropper will be used to collect a representative sample from the dip for species identification. A representative sample consists of mosquito larvae with all the various instars (life stages) present. At sites that possess poor open water habitat in the center and good habitat around the perimeter, a *linear approach* (walking around the perimeter and sampling the margins) may be used to collect samples. At small sites (less than an acre) with good habitat, the dipping effort can be completed using *surface approach* where the entire site is methodically sampled.

- *linear approach*; sites 1 acre in size and less are dipped approximately every 20 feet; sites 1 to 10 acres are dipped approximately every 50 to 100 feet and sites greater than 10 acres are dipped approximately every 200 to 500 feet.
- *surface approach*; sites 1 acre in size and less are dipped approximately every 10 to 20 square feet. Since each project site varies in size, physical characteristics, and changes as the season progresses (e.g., becomes drier, wetter, increased

vegetation), field adjustments may be made during the season concerning appropriate number of dips.

Larval mosquito control methods are designed to reduce the potential risk of WNV. The program's focus for larval control is to identify if *Culex* species are present before initiating control efforts. The threshold for larval control is presence of the vector species. The method allows for pest mosquitoes and non-biting mosquitoes to persist in the environment if vector species are not present. The approach requires more frequent monitoring but results in substantially less treatment of (and therefore less potential adverse impact to) wetlands and other mosquito breeding habitats. The presence or absence of vector species has to be determined before site-specific larval treatment occurs. The objective of larval mosquito control is to prevent the need for adult mosquito control, which is less effective than larval control.

Larval Control Protocol

If larval mosquito monitoring results in the positive identification of *Culex*, then the site will be treated with Bti or other approved larvicide. The application of Bti is the recommended method for larval mosquito control. Bti shall be applied in accordance with the manufacturer's specifications. The usual application rate used for Bti is 5 pounds/acre or 0.2 acres treated per 1.0 pound of Bti. Applicators use appropriate personal protection equipment (PPE) when applying the Bti in accordance with the manufacturer's specifications. All applicators shall be certified, or have the appropriate training.

Depending upon the extent of the *Culex* populations, and the WNV infection rates in adult *Culex*, aerial Bti application may be implemented, in coordination with the adult mosquito monitoring and control program.

Adult Mosquito Monitoring and Control

For the adult mosquito monitoring and control on the PRDRP, It is proposed this activity be the responsibility of Utah County Health Department with cooperation and assistance from PRDRP Project. Proper monitoring of adult mosquitoes, which includes testing for the presence of WNV, is important in guiding prevention and control because it can provide information on the potential threat to residents and can indicate areas where efforts to eliminate mosquitoes should be targeted.

Utah County Health Department conducts adult mosquito monitoring weekly for WNV in adult mosquito populations during the peak of *Culex* activity (June-August). Monitoring adult traps for WNV presence will occur earlier (May) or later (September) or more frequently than planned if data from local partner agencies indicate that there are early, rapidly increasing, or high sustained levels of *Culex* mosquito populations and/or early, elevated, or sustained cases of WNV present in birds and/or humans.

A continued and extensive communication network will serve as the best resource to make the most informed decisions on monitoring and control of WNV. Commission staff

will coordinate and cooperate with the Utah County Health Department regarding the adult mosquito monitoring and control efforts.

Methods

Utah County Health Department monitors adult mosquito populations with the use of CDC mosquito traps (see Appendix A) at 15 locations in Utah County. In 2013, two additional trap sites were added within the delta project area, including one at Skipper Bay, see map in Appendix C for locations. The locations of adult mosquito traps are established to provide a thorough coverage area. These traps are based on the principle that most adult mosquitoes are attracted to CO₂, which is released from the traps. The trap collects adult female mosquitoes that are searching for a blood meal (Utah County Health Department 2012). This is one of the first indicators that WNV is likely to be transmitted to people through the vector mosquito.

The mosquitoes are removed from the traps and sorted by species to detect the vector mosquitoes that may be submitted for WNV testing. The *Culex* species are either sent to the Utah Public Health Laboratory for testing via a PCR method, which provides results in 1-4 days, or processed by the Utah County Health Department through a Rapid Analyte Measurement Platform (RAMP) test that provides results within 2 hours (Utah County Health Department 2012). Mosquito samples from adult traps are submitted and analyzed individually in order to determine a general area where WNV occurs.

Adult Control Protocol

The control of adult mosquitoes is the last option for reducing the threat of WNV. In theory, the ideal larval control plan would eliminate the need for control of adults. However, the rapid development of mosquitoes from egg to adult and the persistent nature of breeding in an extensive variety of stagnant water bodies make complete elimination impossible.

The threshold recommended for adult mosquito control activities is 50 adult *Culex sp.* per trap (R. Mower, personal comment). A doubling or tripling of mosquito numbers in the traps is a better indicator (R. Mower, personal comment). Utah County bases their treatment on their data from peak mosquito production periods. The threshold used by the County is 1,000 *Culex* for all 15 trap sites. Once this threshold is reached, Utah County increases their Ultra Low Volume (ULV fogging) treatment, targeting areas where the trap numbers are high. Control for adult mosquitoes will be determined on a case-specific basis. The PRDRP Project will cooperate with Utah County Health Department in developing and approving chemical treatment methods for adult mosquito control on the project consistent with plans and protocols of both entities, including IPM, Pesticide Management Plan, and this site-specific plan.

WNV Detection

Upon detection of mosquito-borne pathogens in mosquito, monitoring will continue with the following added activities:

- Application by truck-mounted fogger of adulticides to broader areas, based on monitoring data, and vehicle access, may be recommended, consistent with the Commission's Pesticide Management Plan (Commission 2013).
- Consideration of possible larviciding by air, in consultation with the Utah County Health Department, to determine the appropriate threshold.
- Adult mosquito trapping may be increased in the area of concern if additional monitoring data are required.
- Larval monitoring may be enhanced in affected areas if needed.
- Laboratory testing of adult mosquitoes will be a priority in affected areas.

Data from these additional collections will aid in evaluating the extent of pathogen transmission and mosquito populations and be used to guide control activities, where applicable. Monitoring data will be used to assess the risk of an outbreak of human disease and the need to apply pesticides in a targeted area to control adult mosquitoes. The control response will depend on a combination of thresholds being met that include, but are not limited to:

- The overall intensity and persistence of the WNV activity in adult *Culex* mosquitoes, humans, birds, and non-avian vertebrates.
- The time of year.
- Vector index level.
- Seasonal climate.

Communication and Education

Public education and outreach is essential in helping individuals understand WNV and will provide simple precautions that can be taken to help prevent a disease outbreak. Information presented should acknowledge the potential for disease but emphasize the responsibility of individual actions and the necessary measures to reduce health risks.

As a component of this Mosquito Management Plan, the Commission will endeavor to disseminate educational information to the public through established media such as local newspapers, local radio stations, or informational mailings delivered to the homes of residents living nearby.

The Commission will bring important information to the community on methods to reduce residential mosquito breeding areas and products that can repel mosquitoes and provide protection against their bites. It also conveys the concept of the IPM and the hierarchical steps in the integrated program. Familiarity with the IPM will help to clarify

with residents of the area that many actions are conducted, often without their recognition, prior to escalating through the program to the last step of adulticiding which is the most visible mosquito control action.

Perhaps a greater benefit of the Program will be the delivery of educational information designed to compel citizens to help themselves. There are many steps citizens can take to protect themselves from mosquito bites. Self help actions include:

- Protecting themselves and children from adult mosquitoes present by choosing appropriate clothing covering exposed skin to the greatest extent practical and applying mosquito repellants made with “DEET” or Picaridin in accordance with the label directions.
- Management of areas around the home where mosquitoes can lay eggs which would subsequently develop to larva, pupa, and then adult.
- Management of areas around the home where adult mosquitoes rest during the day which typically comprise of tall grass and weeds. Maintenance of tall grass and brush are an effective method of eliminating suitable resting habitats for many mosquito species.
- Avoidance of peak activity times for the WNV vectors or use of repellant during those times.
- Household protection by repairing or installing screens.

If adult mosquito monitoring and testing indicate high infection rates or if human cases of WNV have been reported, then the intensity, message and outlet of the Mosquito Education and Outreach Program shall vary accordingly.

Reporting

As a component of this Mosquito Management Plan, a Geographic Information System (GIS) will be developed to document and compile information on wetland areas, mosquito habitat, mosquito breeding data, adult trapping locations, etc. to aid in mosquito monitoring and control. The GIS will also provide a comprehensive mosquito database which will make data available for program development and data analysis.

The following data will be collected as part of the Mosquito Management Plan.

Larval Mosquito Monitoring

Potential mosquito breeding sites will be mapped and categorized on an annual basis. Sites will be re-categorized as monitoring results dictate.

All monitoring sites shall be assigned a unique Site Number. At a minimum, the following data will be collected at each monitoring site for each monitoring event.

Site no.
Site Category
Date of Sample
Number of samples taken
Sample submitted for Lab Testing (yes, no)
Larval Mosquito ID (yes, no)
Positive Culex Field ID (yes, no)
Larvacide Applied (yes, no)
Larvacide Type
Larvacide Amount Applied

During the monitoring season, monitoring results will be compiled not less than weekly in order to insure that all sites are being monitored on a weekly basis. Weekly sampling results shall be maintained by the Mitigation Commission with the following summary:

Reporting Period
Total Number of Monitoring Sites by Category (use end of month status in the event sites have been recategorized).
Total Number of Monitoring Events During Reporting Period.
Number of Sites Culex positive
Number of Sites Treated with Larvacide

Adult Mosquito Monitoring

Adult mosquito collecting sites are mapped and maintained by the Utah County Health Department. The County will maintain their standard data for each collection site sample. Site location and sample collection within the PRDRP Project boundary will be coordinated with the Utah County Health Department.

Data should be coordinated with the PRDRP Project on an agreed upon frequency to coordinate abatement efforts.

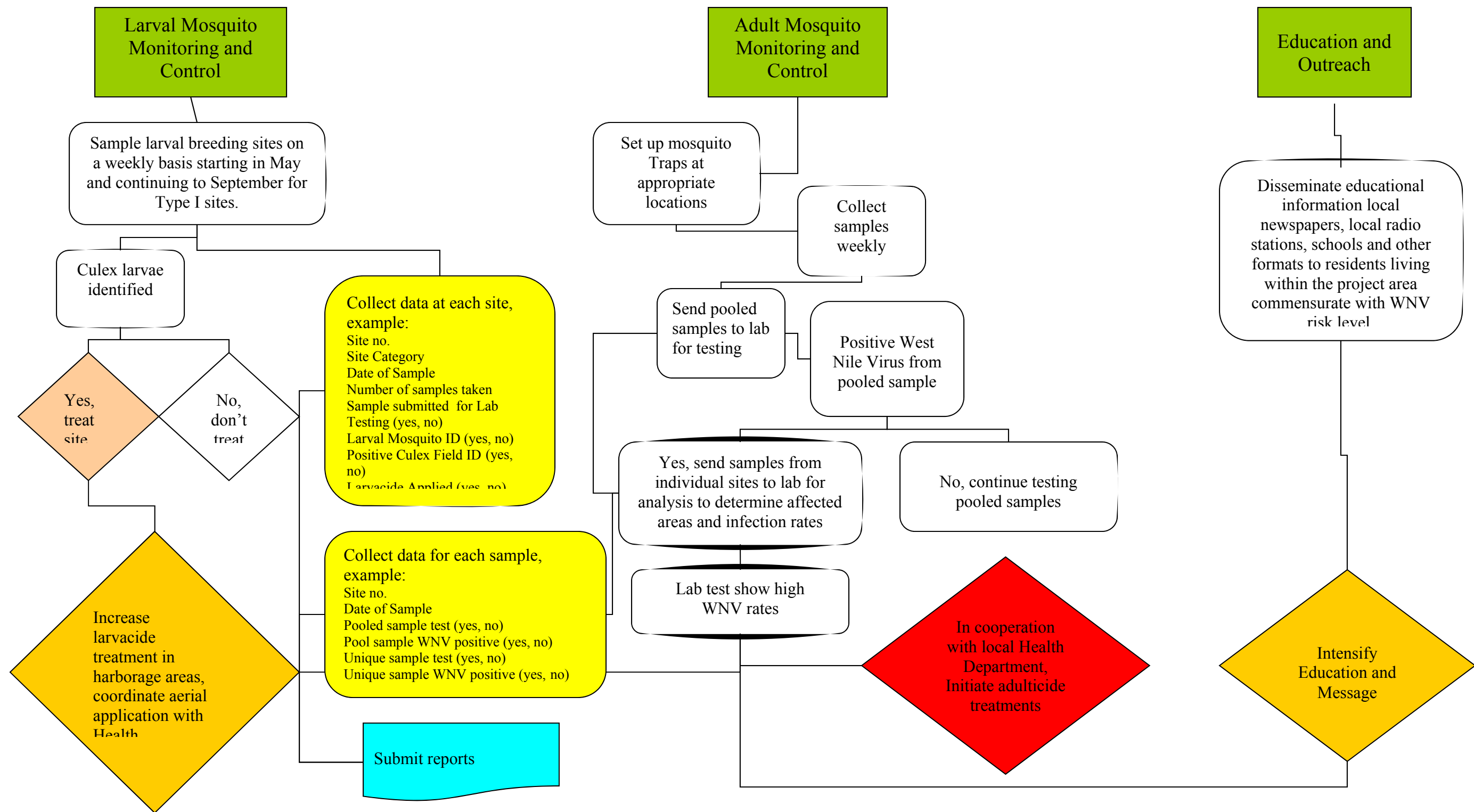


Figure 4. Mosquito Management Plan Flowchart.

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WNVM Web Team U.S. Department of the Interior U.S. Geological Survey. 2008. West Nile Virus Sentinel.
http://diseasemaps.usgs.gov/wnv_ut_sentinel.html

WNVM Web Team U.S. Department of the Interior U.S. Geological Survey. 2008. West Nile Virus Mosquito http://diseasemaps.usgs.gov/wnv_ut_mosquito.html

Appendix A- CDC Mosquito Trap

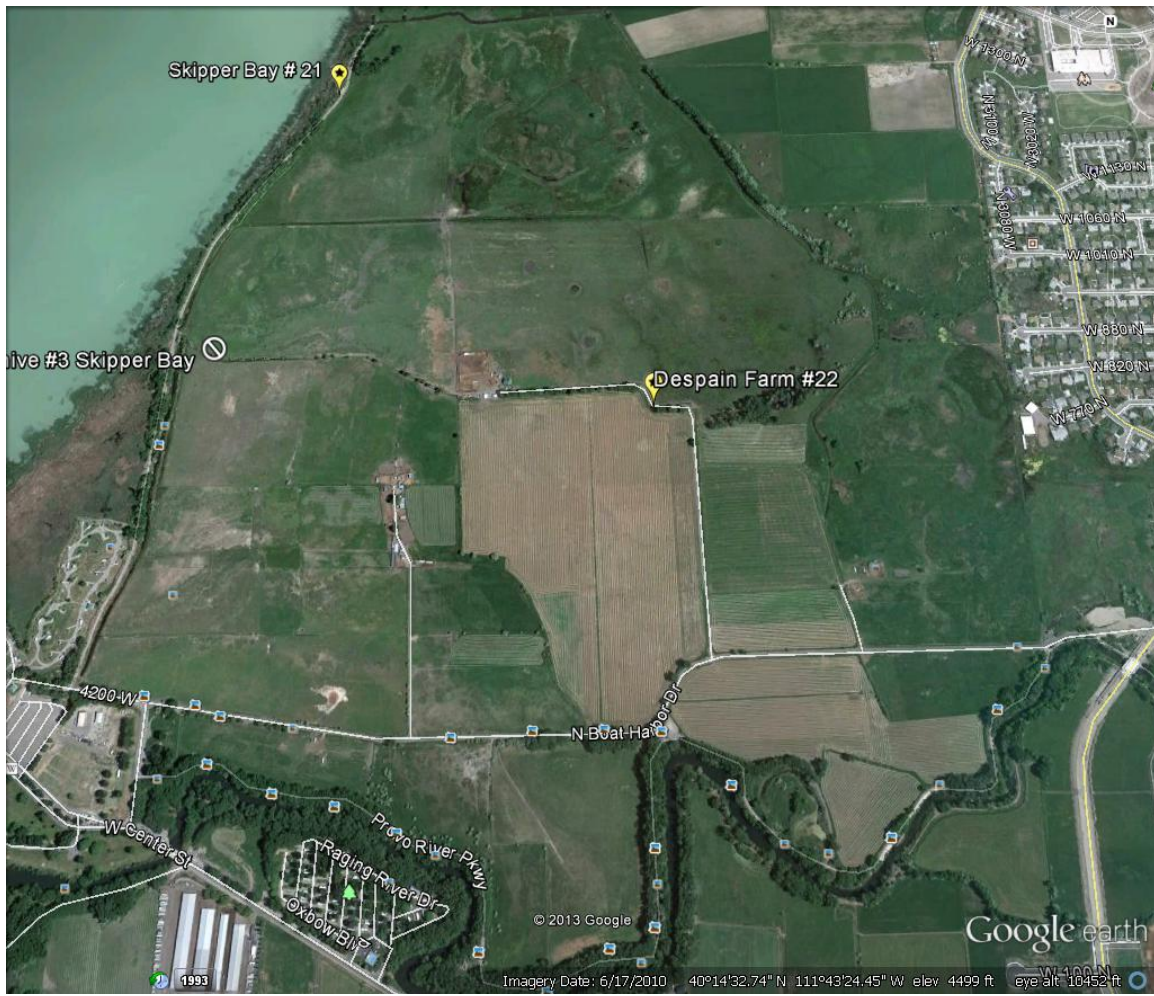


Source: Utah County Health Department, Mosquito Abatement.
<http://www.utahcountyonline.org/Dept2/Health/Mosquito%20Abatement/Documents/Surveillance%20For%20WVV.pdf>

Appendix B - Pesticide Details

Trade Name	Manufacturer	EPA Registration Number
Agnique (monomolecular surface film)	Cognis Corporation Cincinnati, OH	53263-28
Altosid (Methoprene) pellets, briquet or liquid	Zoecon Schaumburg, IL	2724-448 and others
Aqua reslin (Permethrin)	Bayer Environmental Science Research Triangle Park, NC	432-796
Dibrom (Naled, organophosphate)	Amvac Los Angeles, CA	2181-479
Golden Bear Mosquito larvicide oil GB - 1111	Witco Corporation Oildale, CA	8898-16
Pro Vect 1G (Temephos)	AllPro, VGS Bloomington, MN	769-723
Kontrol 4-4 (Permethrin)	Univar Austin, TX	73748-4
Trumpet (Naled, organophosphate)	Amvac Los Angeles, CA	5481-481
VectoBac and VectoLex (Bti) liquid and granular	Valent Biosciences Corp Libertyville, IL	73049-38 and others

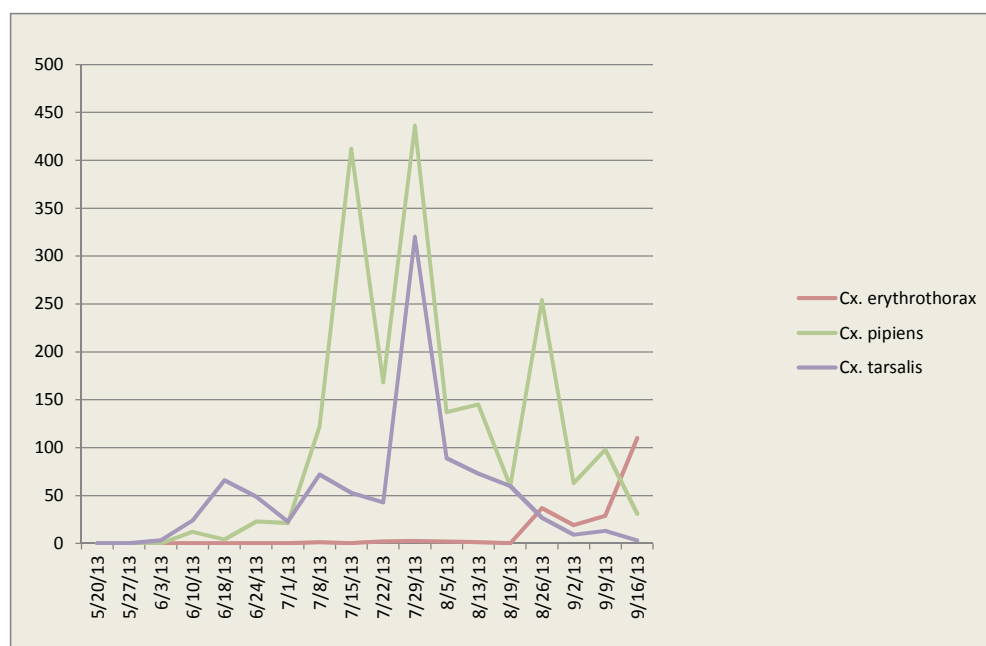
Appendix C – Mosquito trap locations within the PRDRP area.



Appendix D – Summary of Mosquito Monitoring Data, 2013 .

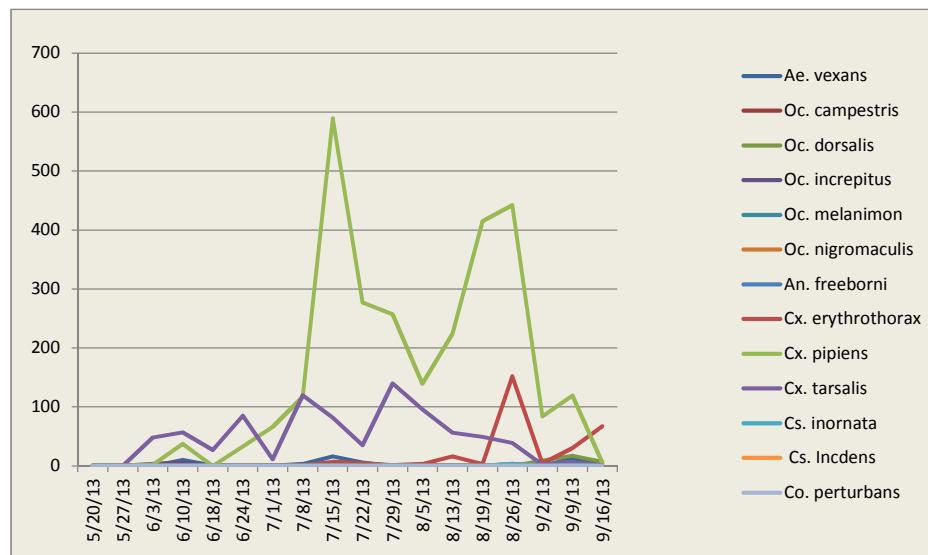
Despain Farm

	<i>Ae. vexans</i>	<i>Oc. campestris</i>	<i>Oc. dorsalis</i>	<i>Oc. increpitus</i>	<i>Oc. melanimon</i>	<i>Oc. nigromaculis</i>	<i>An. freeborni</i>	<i>Cx. erythrothorax</i>	<i>Cx. pipiens</i>	<i>Cx. tarsalis</i>	<i>Cs. inornata</i>	<i>Cs. Incdens</i>	<i>Co. perturbans</i>	TOTALS All Species Footprinters
20-May-13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-May-13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Jun-13	0	0	0	0	0	1	0	0	0	3	0	0	0	4
10-Jun-13	0	0	0	1	0	0	0	0	12	24	0	0	0	37
18-Jun-13	1	0	0	0	0	0	0	0	4	66	0	0	0	71
24-Jun-13	0	0	1	0	0	0	0	0	23	49	0	0	0	73
1-Jul-13	1	0	1	0	0	0	0	0	21	23	0	0	0	46
8-Jul-13	0	0	0	0	0	0	0	1	122	72	0	0	0	195
15-Jul-13	2	0	0	0	0	0	0	0	412	53	2	0	0	469
22-Jul-13	4	0	2	0	0	0	0	2	168	43	0	0	0	219
29-Jul-13	1	0	1	0	0	0	0	2	436	320	1	0	0	761
5-Aug-13	0	0	0	0	0	0	0	2	137	89	0	0	0	228
13-Aug-13	2	0	0	0	0	0	0	1	145	73	0	0	0	221
19-Aug-13	0	0	2	0	1	0	0	0	60	60	0	0	0	123
26-Aug-13	1	0	7	0	0	3	0	37	254	27	2	0	0	331
2-Sep-13	2	0	22	0	0	0	0	19	63	9	0	0	0	115
9-Sep-13	36	0	60	0	0	0	0	29	98	13	3	0	0	239
16-Sep-13	61	0	145	0	0	0	0	110	31	3	0	0	0	350
Totals	111	0	241	1	1	4	0	203	1,986	927	8	0	0	3,482
Percent	3.19%	0.00%	6.92%	0.03%	0.03%	0.11%	0.00%	5.83%	57.04%	26.62%	0.23%	0.00%	0.00%	100.00%



Skipper Bay

	<i>Ae. vexans</i>	<i>Oc. campestris</i>	<i>Oc. dorsalis</i>	<i>Oc. inreptus</i>	<i>Oc. melanimon</i>	<i>Oc. nigromaculis</i>	<i>An. freeborni</i>	<i>Cx. erythrothorax</i>	<i>Cx. pipiens</i>	<i>Cx. tarsalis</i>	<i>Cs. inornata</i>	<i>Cs. Incdens</i>	<i>Co. perturbans</i>	TOTALS All Species Footprinters
20-May-13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-May-13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Jun-13	0	0	0	3	0	0	1	0	2	48	0	0	0	54
10-Jun-13	10	0	1	6	0	0	1	0	37	57	0	0	0	112
18-Jun-13	1	0	0	0	0	0	1	0	0	27	0	0	0	29
24-Jun-13	0	0	0	0	0	0	0	0	33	85	0	0	0	118
1-Jul-13	0	0	0	0	0	0	0	0	66	11	0	0	0	77
8-Jul-13	3	0	0	0	0	0	1	1	117	120	0	0	0	242
15-Jul-13	16	0	1	0	0	0	1	7	589	82	1	0	0	697
22-Jul-13	6	0	0	0	0	0	2	4	277	35	0	0	0	324
29-Jul-13	0	0	0	0	0	0	1	1	257	140	1	0	0	400
5-Aug-13	1	0	0	0	0	0	0	3	139	96	0	0	0	239
13-Aug-13	0	0	0	0	0	0	0	16	224	56	0	0	0	296
19-Aug-13	0	0	0	0	0	0	0	3	415	49	0	0	0	467
26-Aug-13	3	0	0	0	0	0	0	152	442	39	3	0	0	639
2-Sep-13	0	0	9	0	0	0	0	4	84	2	0	0	0	99
9-Sep-13	13	0	17	0	0	0	1	30	119	7	1	0	0	188
16-Sep-13	3	0	7	0	0	0	0	67	6	1	0	0	0	84
Totals	56	0	35	9	0	0	9	288	2,807	855	6	0	0	4,065
Percent	1.38%	0.00%	0.86%	0.22%	0.00%	0.00%	0.22%	7.08%	69.05%	21.03%	0.15%	0.00%	0.00%	100.00%



PROVO RIVER DELTA RESTORATION PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT

Appendix D: Functional Assessment Memo

**BIO-WEST, Inc.**

1063 West 1400 North
Logan, Utah
84321-2291
Ph: 435.752.4202
Fx: 435.752.0507
www.bio-west.com

MEMORANDUM

TO: Darren Olsen

FROM: Alyson Eddie

DATE: January 14, 2014

SUBJECT: Lower Provo River Delta Restoration Wetland Functional Assessment

The following is a summary of the process undertaken to complete the wetlands functional assessment for the Lower Provo River Delta Restoration project.

In 2010 BIO-WEST staff completed a delineation of wetlands located on accessible private properties within the project area. A large portion of the project area known as the Despain Property was not accessible at this time and was delineated in 2011. An assessment of the function of the delineated wetlands was required to determine the wetland restoration potential resulting from the project. Bob Thomas was given verbal approval by Mr. Tim Witman with the U.S. Army Corps of Engineers (USACE) on August 15, 2011 to use the Utah Department of Transportation (UDOT) Wetland Functional Assessment Method for this project. Input from the U.S. Fish and Wildlife Service and Utah Department of Natural Resources was required to complete the wildlife habitat portions of the assessment. A report summarizing the vegetation composition and general condition, including photographs of each wetland assessment area was provided to the agencies for their review. Because BIO-WEST did not have access to the Despain property this initial summary report includes a preliminary assessment of Despain property wetlands as observed from the adjacent properties. BIO-WEST received scoring input for the initial assessment from the agencies on November 17, 2011. In 2012 BIO-WEST was granted access to the Despain property and completed a delineation and assessment of the wetlands at that time. Following the Despain property delineation, a summary report detailing the Despain property wetlands was forwarded to agency personnel. The agency scoring responses regarding these wetlands was received on May 29, 2013. The scoring was then incorporated into the wetland assessment spreadsheet from the initial assessment to provide a complete record of existing wetland function on the project area. Following a site visit and subsequent input from the USACE, some of the Despain property wetland polygons were combined or otherwise slightly modified. The overall changes to wetland community types were minimal. The modified Despain wetland map was used in the scoring spreadsheet included with this memo. See below for additional details.

The wetland functional assessment was performed using the methods described in the UDOT Wetland Functional Assessment Manual. BIO-WEST conducted field data collection for the functional assessment concurrently with the field delineation of wetlands within the project area. Vegetation, soils, and hydrology data were collected in association with wetland sampling points and supported by biologist's observations within each delineated wetland. Each wetland was scored using the assessment method handbook matrix. The level of disturbance within the wetland was assessed relative to the level of disturbance immediately surrounding the wetland and within the wetland boundary. Types of disturbance include grazing, drainage ditches, mowing, crop cultivation, and construction of roads and buildings. The rating of disturbance increases both with the level of disturbance to the wetland itself and the level of disturbance within the surrounding area.

The plant community composition of each wetland was assessed via three categories: presence of expected layers of vegetation; percent of ground cover dominated by native vegetation; and the percent of native wetland plants to non-native or non-wetland plants. The wetlands were scored according to type, with the sum of each category resulting in a numerical score representative of the quality of the vegetation composition in the wetland.

Habitat for federal and state listed species was assessed following consultation with U.S. Fish and Wildlife Service and Utah Division of Wildlife Resources biologists. Agency biologists determine the listed species with documented occurrences or suspected occurrences within the project area. Additionally, the habitat within the project area was determined to be primary, secondary, or incidental habitat for each species. BIO-WEST biologists applied the agency input to each wetland within the project area. The combination of habitat use and species occurrence resulted in the functional score for this variable.

The quality of general wildlife habitat was assessed relative to the level of disturbance within the wetland and the plant community composition; the combined ratings provide the functional score. General fish and aquatic habitat was assessed by evaluating the level of cover and shading available as well as the permanence of the wetland. This variable was not applicable to the majority of the wetlands within the project area. The assessment of general amphibian habitat was dependent upon documented presence of amphibians within the project area. This information was provided from the agency consultation.

The hydrological and biophysical portion of the assessment included an evaluation of flood attenuation. This variable only applied to one wetland within the project area. A more typical assessment for this project was the short and long term surface water storage. Sediment, nutrient, and toxicant retention and removal was assessed by evaluating the percentage of ground with high to moderate surface roughness and any disturbance to the wetland's natural ability to store water compared to the surrounding land uses contribution of sedimentation, nutrients, or toxicants. Lastly, the assessment of sediment and shoreline stabilization was evaluated for ground surface roughness and the duration of surface water adjacent to rooted vegetation.

Each of these variables was given a score for its existing condition to provide a baseline functional assessment score for the project area in its current state. In order to determine the potential effect of the restoration project on the existing wetlands predictive models were developed for each project alternative. These models depict the type, extent, and size of wetlands created by the project alternatives. Assumptions associated with the project are that natural hydrology will be restored to the project area, that non-native and weedy vegetation will be reduced as a result of the project, and that wetlands unaffected by the project will remain in their existing condition. Each wetland type under each project alternative was scored for its expected post restoration condition.

The total number of points given for each assessment variable for an evaluated wetland were summed and divided by the total number of possible points. Variables that were not applicable to the wetland evaluated were omitted from the actual total and the total possible points. The result was a functional percentage. This percentage represents the complete functionality or the amount of functional loss for each wetland. A wetland with a functional percentage of 65 has lost 35% of its functionality, representing a system that has been negatively impacted through some type of disturbance. Conversely, a wetland with a functional score of 95% is relatively undisturbed and retains a high level of ecological functionality.

The difference in the total existing condition score and the post restoration score for each alternative provides the functional change in the project area wetlands under each alternative. The results of the functional assessment show a lift, or net improvement, in the functionality of the project area wetlands.

The results of the functional assessment are detailed in the attached functional assessment spreadsheet. The scoring of the wetlands in their current condition showed a decreased function for the majority of wetlands. This decreased function is indicative of wetlands that have been historically altered due to agricultural and other anthropomorphic changes. Each alternative was evaluated for its projected effect on project wetlands. The post restoration wetland scores reflect higher functionality over existing conditions. The difference in the functional scores shows an overall functional lift in the project area wetland system.

Attached are the following:

The functional assessment scoring sheet;

October 28, 2011 Summary Report Including Wetland Maps for Agencies;

March 13, 2013 Despain Property Summary Report Including Wetland Map for Agencies;

Revised Despain Property Functional Assessment Map (matches the functional assessment scoring sheet below).

PROVO RIVER DELTA RESTORATION FUNCTIONAL ASSESSMENT RESULTS - EXISTING CONDITIONS

Wetland/Site Number	Wetland Size (Acres)	Assessment Area (Acres)	Wetland Classification		Overall Functional Assessment Category*	BIOLOGICAL ASSESSMENT							HYDROLOGICAL/BIPHYSICAL ASSESSMENT					FUNCTIONAL ASSESSMENT RATING (ORIGINAL)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
						15a. Level of Disturbance	15b. Plant Community Composition	15c. Threatened or Endangered Species	15d. UT Natural Heritage Program *	15e. General Wildlife Habitat	15f. General Fish/Aquatic Habitat	15g. General Amphibian Habitat (Yes/No)*	15h. Flood Attenuation	15i. Short/Long Term Surface Water Storage	15j. Sed./Nut./Tox. Retention & Removal	15k. Sediment/Shoreline Stabilization	ACTUAL FUNCTIONAL POINTS/RATING	POSSIBLE FUNCTIONAL POINTS	FUNCTIONAL UNIT (Actual Points X AA Acreage)	PERCENT (%) TOTAL FUNCTIONAL POINTS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
A1	38.2	38.2	Lacustrine Fringe	FL		H	0.1	0.8	0.7	0.2	0.3	0.2	N/A	1.0	0.6	1.0	4.9	8.0	187.2	61%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
B1	1.1	1.1	Depressional	SPF		H	0.2	0	0.7	0.2	N/A	0.2	N/A	0.8	0.9	N/A	3.0	6.0	3.3	50%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
C1	4.5	4.5	Depressional	E		H	1.0	0.0	0.1	0.6	N/A	0.2	N/A	0.4	0.9	N/A	3.2	6.0	14.4	53%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
E1	2.6	2.6	Depressional	SPPF		H	1.0	0.0	0.7	0.6	N/A	0.2	N/A	0.8	0.9	N/A	4.2	6.0	10.9	70%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
F1	2.6	2.6	Slope	SF		H	0.2	0.3	0.7	0.2	N/A	0.2	N/A	0.4	0.9	N/A	2.9	6.0	7.5	48%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
F2	20.9	20.9	Slope	SF		H	0.2	0.9	0.7	0.2	N/A	0.2	N/A	0.4	0.9	N/A	3.5	6.0	73.2	58%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
F3	1.1	1.1	Slope/Raised Fen	PF		H	1.0	0.0	0.7	0.6	N/A	0.2	N/A	0.4	0.9	N/A	3.8	6.0	4.2	63%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
F4	4.1	4.1	Slope	SPF		H	1.0	0.7	0.7	0.6	N/A	0.2	N/A	0.4	0.9	N/A	4.5	6.0	18.5	75%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
F5	1.1	1.1	Slope	SF		H	0.2	0.0	0.7	0.2	N/A	0.2	N/A	0.4	0.9	N/A	2.6	6.0	2.9	43%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
F6	13.6	13.6	Slope	SPF		H	0.4	0.9	0.7	0.2	N/A	0.2	N/A	0.4	0.9	N/A	3.7	6.0	50.3	62%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
F7	1.5	1.5	Riverine	E		H	0.5	0.3	0.7	0.2	0.3	0.2	0.4	N/A	0.3	0.3	3.2	8.0	4.8	40%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
F8	2.4	2.4	Slope	SF		H	0.2	0.7	0.7	0.2	N/A	0.2	N/A	0.4	0.9	N/A	3.3	6.0	7.9	55%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
H1	4.0	4.0	Slope	SF		H	0.2	0.0	0.7	0.2	N/A	0.2	N/A	0.4	0.9	N/A	2.6	6.0	10.3	43%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
I1	73.5	73.5	Depressional	SPPF		H	1.0	0.9	0.8	0.6	N/A	0.2	N/A	0.8	0.9	N/A	5.2	6.0	382.2	87%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
I2	41.3	41.3	Depressional	SF		H	0.2	0.9	0.6	0.6	N/A	0.2	N/A	0.8	0.9	N/A	4.2	6.0	173.5	70%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
I3	14.8	14.8	Depressional	SF		H	0.6	0.9	0.1	0.2	N/A	0.0	N/A	0.8	0.9	N/A	3.5	6.0	51.8	58%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
I4	28.1	28.1	Depressional	SF		H	0.6	0.9	0.1	0.2	N/A	0.0	N/A	0.8	0.9	N/A	3.5	6.0	98.4	58%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
I5	2.3	2.3	Depressional	E		H	0.4	0.0	0.8	0.2	N/A	0.2	N/A	0.6	0.7	N/A	2.9	6.0	6.7	48%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
I6	1.2	1.2	Slope/Raised Fen	SP		H	0.2	0.9	0.0	0.2	N/A	0.0	N/A	0.8	0.9	N/A	3.0	6.0	3.6	50%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
I7	1.0	1.0	Depressional	SF		H	0.6	0.9	0.1	0.2	N/A	0.0	N/A	0.8	0.9	N/A	3.5	6.0	3.5	58%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
I8	0.9	0.9	Slope/Raised Fen	SP		H	0.2	0.9	0.1	0.2	N/A	0.2	N/A	0.8	0.9	N/A	3.3	6.0	3.0	55%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
I9	5.6	5.6	Depressional	E		H	0.6	0.0	0.6	0.6	N/A	0.2	N/A	0.8	0.9	N/A	3.7	6.0	20.7	62%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
I10	1.2	1.2	Slope/Raised Fen	SP		H	1.0	0.9	0.6	0.6	N/A	0.2	N/A	0.8	0.9	N/A	5.0	6.0	6.0	83%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
I11	2.4	2.4	Depressional	SF		H	1.0	0.9	0.1	0.6	N/A	0.2	N/A	0.8	0.9	N/A	4.5	6.0	10.8	75%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
I12	0.2	0.2	Depressional	E		H	0.2	0.9	0.1	0.2	N/A	0.2	N/A	0.8	0.9	N/A	3.3	6.0	0.7	55%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
I13	0.1	0.1	Depressional	E		H	0.4	0.0	0.2	0.2	N/A	0.2	N/A	0.8	0.9	N/A	2.7	6.0	0.3	45%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
M1	0.4	0.4	Depressional	SF		L	0.8	0.0	0.0	1.0	N/A	0.2	N/A	1.0	0.9	N/A	3.9	6.0	1.6	65%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
M2	3.4	3.4	Slope/Raised Fen	SP		L	1.0	0.9	0.9	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.9	6.0	20.1	98%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
M3	6.8	6.8	Depressional	SF		L	1.0	0.0	0.8	1.0	N/A	0.2	N/A	1.0	0.9	N/A	4.9	6.0	33.3	82%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
M4	6.0	6.0	Depressional	SF		L	0.8	0.7	0.6	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.2	6.0	31.2	87%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
TOTAL EXISTING FUNCTIONAL UNITS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

POST RESTORATION - Alternative A

	2.4	2.4	Riverine			L	0.9	0.9	0.9	1.0	0.6	0.2	0.8	N/A	0.9	0.8	7.0	8.0	16.8	88%
	202.0	202.0	Emergent Marsh (Lacustrine Fringe)	FL		L	1.0	0.7	0.6	1.0	0.7	0.2	N/A	1.0	0.6	1.0	6.8	8.0	1373.6	85%
	150.8	150.8	Wet Meadow	SF		L	0.8	0.9	0.7	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.5	6.0	829.4	92%
	0.5	0.5	Emergent Ditch	SP		M	0.8	0.0	0.7	0.6	N/A	0.2	N/A	1.0	0.9	N/A	4.2	6.0	2.1	70%
	26.6	26.6	Emergent Marsh Phragmites Dominant	FL		H	0.1	0.8	0.7	0.2	0.3	0.2	N/A	1.0	0.6	1.0	4.9	8.0	130.3	61%
	4.1	4.1	Forested Wetland	SF		L	1.0	0.9	0.9	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.9	6.0	24.2	98%
	7.8	7.8	Slope/Raised Fen	SP		L	1.0	0.9	0.9	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.9	6.0	46.0	98%
	35.7	35.7	Lacustrine Vegetated Aquatic Bed	SF		L	1.0	0.7	0.6	1.0	0.7	0.2	N/A	1.0	0.6	1.0	6.8	8.0	242.8	85%
	49.8	49.8	Wet Meadow/ Emergent Marsh Complex	SPPF		M	0.8	0.9	0.7	0.8	N/A	0.2	N/A	0.8	0.7	N/A	4.9	6.0	244.0	82%

TOTAL POST RESTORATION FUNCTIONAL UNITS

2909.2

TOTAL NET GAIN OF FUNCTIONAL UNITS, POST RESTORATION UNITS (2909.2) - EXISTING UNITS (1242.4) = 1666.8**POST RESTORATION - Alternative B**

	0.2	0.2	Riverine	E		L	0.9	0.9	0.9	1.0	0.6	0.2	0.8	N/A	0.9	0.8	7.0	8.0	1.4	88%
	141.7	141.7	Emergent Marsh (Lacustrine Fringe)	FL		L	1.0	0.7	0.6	1.0	0.7	0.2	N/A	1.0	0.6	1.0	6.8	8.0	963.6	85%
	62.4	62.4	Wet Meadow	SF		L	0.8	0.9	0.7	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.5	6.0	343.2	92%
	0.5	0.5	Emergent Ditch	E		M	0.8	0.0	0.8	0.6	N/A	0.2	N/A	1.0	0.9	N/A	4.3	6.0	2.2	72%
	32.1	32.1	Emergent Marsh Phragmites Dominant	FL		H	0.1	0.8	0.7	0.2	0.3	0.2	N/A	1.0	0.6	1.0	4.9	8.0	157.3	61%
	3.8	3.8	Forested Wetland	SF		L	1.0	0.9	0.9	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.9	6.0	22.4	98%
	7.8	7.8	Slope/Raised Fen	SP		L	1.0	0.9	0.9	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.9	6.0	46.0	98%
	29.2	29.2	Lacustrine Vegetated Aquatic Bed	E		L	1.0	0.7	0.6	1.0	0.7	0.2	N/A	1.0	0.6	1.0	6.8	8.0	198.6	85%
	4.6	4.6	Saline Wet Meadow	SF		H	1.0	0.0	0.1	0.6	N/A	0.2	N/A	0.4	0.9	N/A	3.2	6.0	14.7	53%
	49.8	49.8	Wet Meadow/ Emergent Marsh Complex	SPPF		M	0.8	0.9	0.7	0.8	N/A	0.2	N/A	0.8	0.7	N/A	4.9	6.0	244.0	82%

TOTAL POST RESTORATION FUNCTIONAL UNITS

1993.3

TOTAL NET GAIN OF FUNCTIONAL UNITS, POST RESTORATION UNITS (1993.3) - EXISTING UNITS (1242.4) = 750.9

POST RESTORATION - Alternative C																					
	1.1	1.1	Riverine	E		L	0.9	0.9	0.9	1.0	0.6	0.2	0.8	N/A	0.9	0.8	7.0	8.0	7.7	88%	
	102.7	102.7	Emergent Marsh (Lacustrine Fringe)	FL		M	1.0	0.7	0.6	1.0	0.7	0.2	N/A	1.0	0.6	1.0	6.8	8.0	698.4	85%	
	69.3	69.3	Emergent Marsh (unaltered)*	SF		-	-	-	-	-	-	-	-	-	-	-			426.4		
	125.4	125.4	Wet Meadow	SF		M	0.8	0.9	0.7	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.5	6.0	689.7	92%	
	48.4	48.4	Wet Meadow (unaltered)*	SF		-	-	-	-	-	-	-	-	-	-	-			197.7		
	26.7	26.7	Emergent Marsh Phragmites Dominant	FL		H	0.1	0.8	0.7	0.2	0.3	0.2	N/A	1.0	0.6	1.0	4.9	8.0	130.8	61%	
	0.7	0.7	Forested Wetland	SF		L	1.0	0.9	0.9	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.9	6.0	4.1	98%	
	3.4	3.4	Forested Wetland (unaltered)*			-	-	-	-	-	-	-	-	-	-	-			14.5		
	22.2	22.2	Lacustrine Vegetated Aquatic Bed	E		L	1.0	0.7	0.6	1.0	0.7	0.2	N/A	1.0	0.6	1.0	6.8	8.0	151.0	85%	
	0.9	0.9	Slope/Raised Fen	SP		L	1.0	0.9	0.9	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.9	6.0	5.3	98%	
	6.9	6.9	Slope/Raised Fen (unaltered)*			-	-	-	-	-	-	-	-	-	-	-			33.8		
	3.6	3.6	Wet Meadow/Emergent Marsh Complex	SF		L	1.0	0.9	0.9	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.9	6.0	21.2	98%	
	46.1	46.1	Wet Meadow/Emergent Marsh Complex (unaltered)*	SF		-	-	-	-	-	-	-	-	-	-	-			165.5		
TOTAL POST RESTORATION FUNCTIONAL UNITS																			2546.1		
*Alternative C includes large areas of existing wetlands that will be unaltered, the existing functional unit scores were put into the spreadsheet to reflect this.																					
TOTAL NET GAIN OF FUNCTIONAL UNITS, POST RESTORATION UNITS (2546.1) - EXISTING UNITS (1242.4) = 1303.7																					

*Alternative C includes large areas of existing wetlands that will be unaltered, the existing functional unit scores were put into the spreadsheet to reflect this.

TOTAL NET GAIN OF FUNCTIONAL UNITS, POST RESTORATION UNITS (2546.1) - EXISTING UNITS (1242.4) = 1303.7

Proposed Provo River Delta Restoration Project

Utah County, Utah

**Draft Summary for Agency Review and Scoring using the
Utah Department of Transportation, Wetland Functional Assessment Method**

October 28, 2011

Personnel: Bob Thomas (Wetland Scientist, BIO-WEST, Inc.)
Travis Taylor (Vegetation Technician, BIO-WEST, Inc.)
Steve Ripple (Botanist, Independent Contractor)
John Rice (Wetland Scientist, Utah Mitigation Commission)

Field Work Performed: September and October, 2011

Summary Prepared by BIO-WEST, Inc.

Introduction

The Utah Reclamation Mitigation and Conservation Commission (URMCC) is proposing to restore approximately 734-acres of the historic Provo River Delta at Utah Lake in Utah County, Utah. The project area has been heavily altered through the construction of the Utah Lake levee, the installation of a large scale drainage system behind the levee, the channelization of the Provo River, and intensive agricultural activities. The project would involve restoring the natural meandering Provo River channel through the historic river delta (project area), and removal of the existing flood control levee on the Utah Lake shoreline. The completed project would allow the restored river and Utah Lake to resume the natural flood cycles within the project area. The purpose of the project is the restoration of critical habitat for the federally endangered June Sucker (*Chasmistes liorus*).

Despite the existing alterations, the project area contains extensive existing wetlands that are supported by a high groundwater table and slope drainage. These altered wetlands continue to provide a measurable amount of ecological function to the existing ecosystem. The U.S. Army Corps of Engineers (USACE) has requested that the URMCC evaluate and quantify the ecological function provided by the project area wetlands as they currently exist. The existing ecological functions can then be compared to the post-project level of the restored ecological functions, allowing for an estimate of the expected change.

The Utah Department of Transportation (UDOT) developed a Wetland Functional Assessment Method and published a handbook of the method for public use in April 2006. The UDOT assessment is commonly used in Utah and has been approved by the USACE regional office in Bountiful, Utah. BIO-WEST, Inc. on behalf of the URMCC has delineated the project area wetlands and gathered the necessary field data to perform a wetland functional assessment of the project area using the UDOT method. In addition to the field data that has been gathered, the UDOT manual requires site specific input from the U.S. Fish and Wildlife Service and the Utah Department of Wildlife Resources for completion of the functional assessment. This summary is intended to provide these agencies with the information required to complete applicable sections of the project area functional assessment.

The information provided within this summary includes;

- a photograph and brief description of each assessed wetland within the project area,
- a location map of the assessed wetlands,
- selected pages from the UDOT assessment handbook for use in agency responses to questions 12, 15c, 15d, and 15g.
- a spreadsheet summary of the assessed wetland scoring with the agency required response columns highlighted.

October 27, 2011

Wetland A1.

Wetland Size: 38.2 acres

Wetland Classification: Lacustrine Fringe



Summary: Wetland A1 is a lacustrine fringe wetland located below the ordinary high water mark along the eastern shore of Utah Lake. This wetland is adjacent to the Utah lake levee and a state park campground. The vegetation is dominated by a monoculture of common reed (*Phragmites australis*). The disturbance level is high due to the adjacent campground and levee. The wetland is permanently flooded. Wetland A1 was likely open water or a rooted aquatic lacustrine fringe wetland prior to construction of the Utah Lake levee. Wetland A1 did not appear to contain suitable habitat for Ute lady's tresses.

October 27, 2011

Wetland B1.

Wetland Size: 1.1 acres

Wetland Classification: Depressional



Summary: Wetland B1 is a drainage ditch containing open water and emergent wetland vegetation. The wetland is dominated by mixture of native and non-native species including reed canary grass (*Phalaris arundinaceae*), narrowleaf willow (*Salix exigua*), Russian olive (*Elaeagnus angustifolia*), Siberian elm (*Ulmus pumila*), crack willow (*Salix fragilis*), annual ragweed (*Ambrosia artemisiifolia*), hardstem bulrush (*Schoenoplectus acutus*), cattail (*Typha latifolia*), mountain rush (*Juncus arcticus*), and annual rabbitsfoot grass (*Polypogon monspeliensis*). The disturbance level is high due to heavy grazing and drainage of the ditch to an automated pumping system. The soils are mineral and hydrology is permanent freshwater. Wetland B1 was likely a marshy emergent lacustrine fringe wetland or rooted aquatic bed prior to construction of the Utah Lake levee. Wetland B1 did not appear to contain suitable habitat for Ute lady's tresses.

October 27, 2011

Wetland C1.

Wetland Size: 4.5 acres

Wetland Classification: Depressional



Summary: Wetland C1 is a saline emergent depression wetland dominated by salt grass (*Distichlis spicata*), red swampfire (*Salicornia rubra*), fivehorn smotherweed (*Bassia hyssopifolia*), and marshland goosefoot (*Chenopodium rubrum*). The disturbance level of the wetland is high due to heavy grazing, an adjacent drainage ditch, and a drainage ditch that bisects the wetland and effectively prevents inundation. The soils are mineral and hydrology is seasonal ephemeral. The dominant vegetation suggests highly saline conditions within the wetland. Wetland C1 was likely a marshy emergent lacustrine fringe wetland prior to construction of the Utah Lake levee. Wetland C1 did not appear to contain suitable habitat for Ute lady's tresses.

October 27, 2011

Wetland E1.

Wetland Size: 2.6 acres

Wetland Classification: Depressional



Summary: Wetland E1 is a depressional oxbow wetland that has been cut off from the Provo River. The wetland contains elements of open water, rooted aquatics, shrub/scrub, and emergent areas. The dominant vegetation includes reed canary grass, narrowleaf willow, Russian olive, Siberian elm, and crack willow. Soils are organic silt and hydrology is permanent surface water. The disturbance level is high due to the presence of a paved recreational trail around the entire wetland. The wetland has been separated from Provo River flooding and anaerobic conditions are typical in the open water areas of the wetland. Wetland E1 did not appear to contain suitable habitat for Ute lady's tresses.

October 27, 2011

Wetland F1.

Wetland Size: 2.6 acres

Wetland Classification: Slope



Summary: Wetland F1 is an emergent wetland dominated by introduced forage species such as strawberry clover (*Trifolium fragiferum*), red clover (*Trifolium pratense*), annual bluegrass (*Poa annua*), and a combination of native and introduced species including bushy knotweed (*Polygonum ramosissimum*), redtop (*Agrostis gigantea*), quack grass (*Elymus repens*), and various wheat grasses. Wetland species such as hardstem bulrush, wooly sedge (*Carex lasiocarpa*), Nebraska sedge (*Carex nebrascensis*), mountain rush, and common spikerush (*Eleocharis palustris*) are less predominate but present in small depressions throughout the sloping terrain. The disturbance level is high due to heavy grazing and alterations to the natural wetland hydrology including ditches and a drainage pumping station. The soils are organic and hydrology is seasonal freshwater. This wetland is near known habitat (wetlands F2 and F6) for Ute lady's tresses (*Spiranthes diluvialis*), however; two years of surveys were performed and the plant was not observed within wetland F1.

October 27, 2011

Wetland F2.

Wetland Size: 20.9 acres

Wetland Classification: Slope



Summary: Wetland F2 is an emergent wetland with a mix of native and non-native species, dominated by annual ragweed, Joe-pye weed (*Eupatorium maculatum*), hardstem bulrush, meadow fescue (*Schedonorus pratensis*), Nuttall's sunflower (*Helianthus Nuttallii*), common three square (*Schoenoplectus pungens*), field mint (*Mentha arvensis*), spearmint (*Mentha spicata*), lady's thumb (*Polygonum persicaria*), water knotweed (*Polygonum amphibium*), redtop, and quack grass. The disturbance level is high due to heavy grazing, several drainage ditches, and other structures. The soils are organic and hydrology is seasonal freshwater. A documented Ute lady's tresses population occurs in this assessment area.

October 27, 2011

Wetland F3.

Wetland Size: 1.1 acres

Wetland Classification: Slope (Raised Fen)



Summary: Wetland F3 is a raised fen surrounded by weedy uplands and emergent wet meadow areas. Wetland F3 contains mostly native vegetation including stinging nettle (*Urtica dioica*), western aster (*Symphyotrichum ascendens*), western goldenrod (*Solidago occidentalis*), common three square, mountain rush, common spikerush, swamp verbena (*Verbena hastata*), seaside arrowgrass (*Triglochin maritima*), rough bugleweed (*Lycopus asper*), and annual ragweed on the fringes. The disturbance level is characterized as high due to heavy grazing and nearby drainage ditches. The soils are organic and hydrology is persistent freshwater. This wetland is near known habitat (wetlands F2 and F6) for Ute lady's tresses, however; two years of surveys have been performed and the plant was not observed within wetland F3.

October 27, 2011

Wetland F4.

Wetland Size: 4.1 acres

Wetland Classification: Slope



Summary: Wetland F4 is a grazed emergent wetland. The dominant vegetation consists of native species including common three square, common spikerush, mountain rush, wooly sedge, Nebraska sedge, meadow hawksbeard (*Crepis runcinata*), swamp pricklegass (*Crypsis schoenoides*), and scratchgrass (*Muhlenbergia asperifolia*). The upland grass squirreltail (*Elymus elymoides*) is also present and was probably planted in the meadow as a forage species or is propagating from bordering areas. The disturbance level is high due to heavy grazing and adjacent drainage ditches. Soils are organic and hydrology is seasonal and persistent freshwater. This wetland is near known habitat (wetlands F2 and F6) for Ute lady's tresses, however; two years of surveys have been performed and the plant was not observed within wetland F4.

October 27, 2011

Wetland F5.

Wetland Size: 1.1 acres

Wetland Classification: Slope



Summary: Wetland F5 is a disturbed pasture with saturated soils. The wetland is dominated by non-native and native vegetation including annual bluegrass, bushy knotweed, annual ragweed, spiny cocklebur (*Xanthium spinosum*), marshland goosefoot, and hardstem bulrush. The disturbance level is high due to heavy grazing, drainage ditches, and structures. The soils are organic and hydrology is seasonal freshwater. This wetland is near known habitat (wetlands F2 and F6) for Ute lady's tresses, however; two years of surveys have been performed and the plant was not observed within wetland F5.

October 27, 2011

Wetland F6.

Wetland Size: 13.6 acres

Wetland Classification: Slope



Summary: Wetland F6 is a disturbed emergent wetland. The wetland is dominated by a mix of native and non-native vegetation including common three square, mountain rush, Nuttall's sunflower, Joe-pye weed, common spikerush, and western aster. The disturbance level is considered high due to heavy grazing and an adjacent drainage ditch that hinders inundation. The soils are organic and hydrology is seasonal freshwater. A documented Ute lady's tresses population occurs in wetland F6 and a single plant was observed during the wetland assessment.

October 27, 2011

Wetland F7.

Wetland Size: 1.5 acres

Wetland Classification: Riverine



Summary: Wetland F7 is a riverine wetland with a small stream discharging from an upslope culvert into the project area. The banks of the water course and the floodplain bench are characterized by a combination of native and non-native wetland and aquatic plants including common spikerush, common three square, reed canary grass, watercress (*Nasturtium officinale*), annual rabbitsfoot grass, common reed, and Russian olive. The disturbance level is high due to heavy grazing, several culvert stream crossings, a straightened stream channel, fill material within the natural floodplain bench, and the stream outflow into a drainage canal. The soils are organic and hydrology is permanent freshwater. Wetland F7 lacks a native riparian shrub community and a natural floodplain bench. This wetland is near known habitat (wetlands F2 and F6) for Ute lady's tresses, however; two years of surveys have been performed and the plant was not observed within wetland F7.

October 27, 2011

Wetland F8.

Wetland Size: 2.4 acres

Wetland Classification: Slope



Summary: Wetland F8 is an emergent grazed pasture bordering the floodplain bench of wetland F7. The wetland is dominated by a mixture of native and non-native vegetation including intermediate wheatgrass (*Thynopyrum intermedium*), annual bluegrass, redtop, reed canary grass, and Nuttall's sunflower. The northern margins of the wetland contain annual ragweed and Russian olive. The disturbance level is high because of heavy grazing and a large adjacent drainage canal. The soils are organic and hydrology is seasonal freshwater. This wetland is near known habitat (wetlands F2 and F6) for Ute lady's tresses, however; two years of surveys have been performed and the plant was not observed within wetland F8.

October 27, 2011

Wetland H1.

Wetland Size: 1.9 acres

Wetland Classification: Slope



Summary: Wetland H1 is a weedy agricultural field supporting wetland vegetation in a depression. The vegetation is characterized by a mix of non-native and native weedy species such as prickly Russian thistle (*Salsola tragus*), lambsquarters (*Chenopodium album*), lady's thumb, annual blue grass, and reed canary grass. The wetland is surrounded by upland weedy vegetation. The disturbance level is high due to agricultural cultivation and grazing, fill material, the adjacent paved highway, and an adjacent ditch. The soils are mineral and hydrology is seasonal freshwater. Wetland H1 did not appear to contain suitable habitat for Ute lady's tresses.

October 27, 2011

Wetland I1.

Wetland Size: 135.8 acres

Wetland Classification: Depressional



Summary: Wetland I1 is an emergent wet meadow and emergent marsh complex. The vegetation is dominated by a mixture of native and non-native plants including reed canary grass, mountain rush, common three square, water sedge (*Carex aquatilis*), Nebraska sedge, saltgrass, cattail (*typha latifolia*), strawberry clover, spiny cocklebur, and curly dock (*Rumex crispus*). The disturbance level is high due to heavy grazing and a drainage ditch surrounding the wetland. The soils are organic and hydrology is seasonal freshwater and permanent freshwater. A known Ute lady's tresses population has been documented within wetland I1 but the exact location is unknown. A Provo City wetland mitigation area is located within wetland I1, however; this mitigation area was not assessed due to a lack of site access. The mitigation area is fenced off to prevent grazing. Wetland I1 was likely emergent and rooted aquatic lacustrine fringe wetland prior to construction of the Utah Lake levee.

October 27, 2011

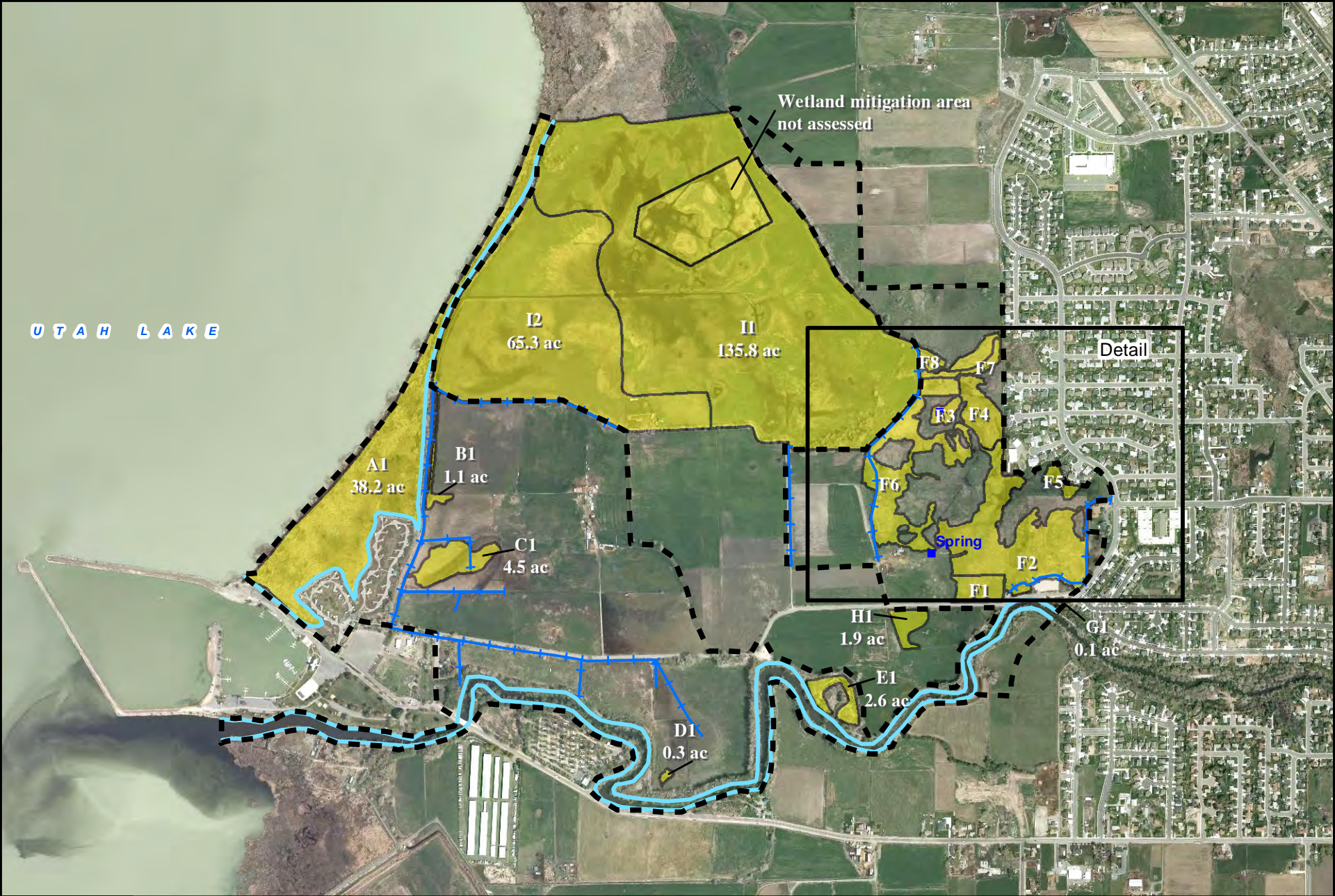
Wetland I2.

Wetland Size: 65.3 acres

Wetland Classification: Depressional



Summary: Wetland I2 is a grazed pasture with some wet meadow characteristics transitioning to upland areas. The vegetation is dominated by a mixture of native and non-native species including salt grass, intermediate wheatgrass, strawberry clover, red top, and mountain rush. The disturbance level is high due to heavy grazing and drainage ditches surrounding the wetland. The soils are organic and hydrology is ephemeral and seasonal. Wetland I2 was likely emergent and rooted aquatic lacustrine fringe wetland prior to construction of the Utah Lake levee. Wetland I2 did not appear to contain suitable habitat for Ute lady's tresses.



BIO-WEST, Inc.

- Project Boundary
- Ordinary High Water Mark
- Irrigation Canals
- Spring
- Wetlands

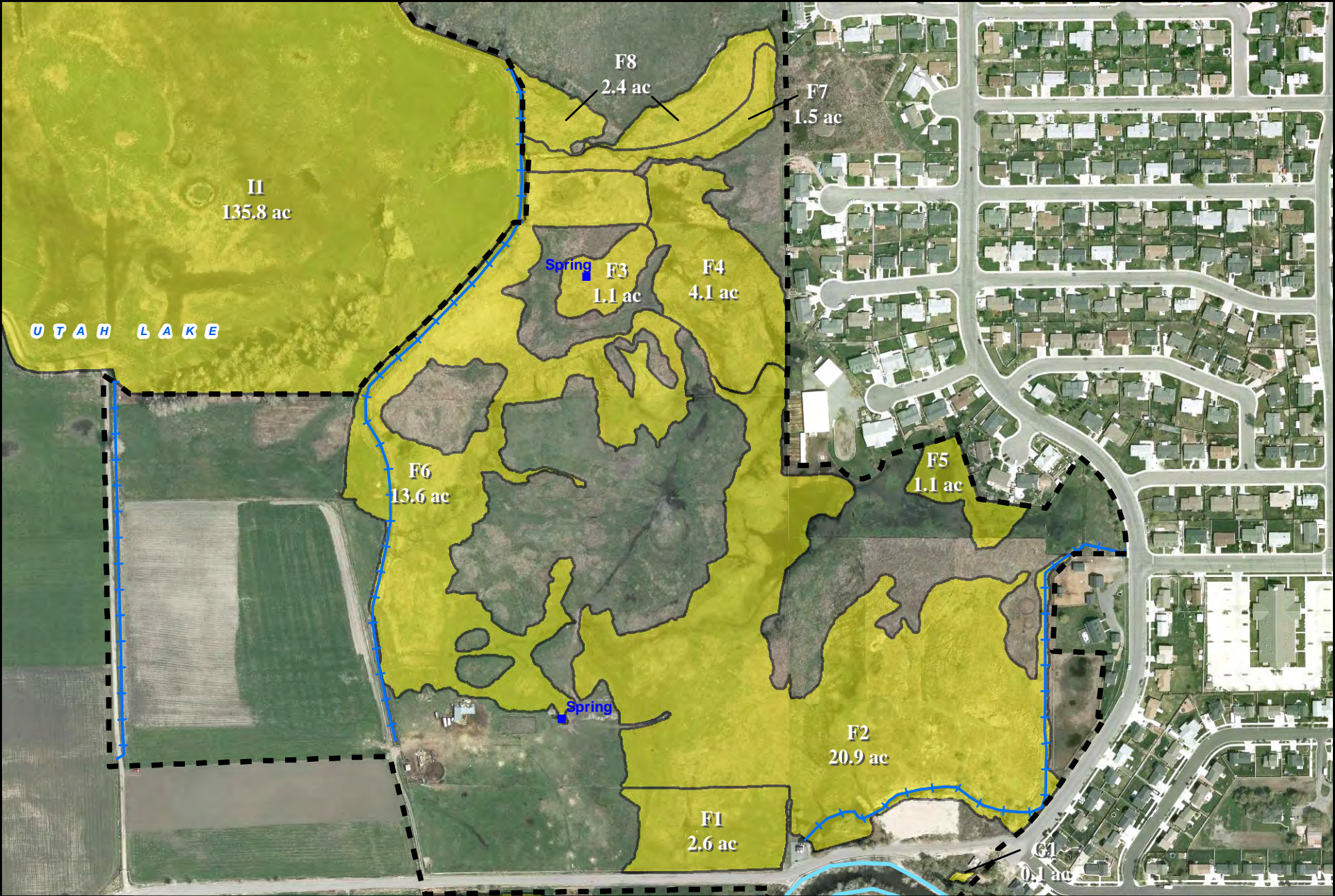
1 inch = 1,250 feet

0 0.1 0.2 Miles

0 375 750 1,500 Feet

Basemap: 2009 HRO 1" Color
 Orthophotography, Utah AGRC
 Projection: State Plane, Utah Central,
 FIPS 4302
 Map dated Oct 25, 2011

Draft Wetland Functional Assessment Map



Project Boundary



Ordinary High Water Mark



Irrigation Canals



Spring



Wetlands

1 inch = 400 feet

0 0.0325 0.065 Miles

0 115 230 460 Feet



Basemap: 2009 HRO 1" Color
Orthophotography, Utah AGRC
Projection: State Plane, Utah Central,
FIPS 4302
Map dated Oct 25, 2011

**Draft Wetland Functional
Assessment Map Detail**

Proposed Provo River Delta Restoration Project

Utah County, Utah

Summary for Agency Review and Scoring Using the Utah Department of Transportation Wetland Functional Assessment Method

March 12, 2013

Personnel: Bob Thomas (Wetland Scientist, BIO-WEST, Inc.)
Kari Coy (Botany Technician, BIO-WEST, Inc.)

Fieldwork Performed: August 22 and 23, 2012

Summary Prepared by BIO-WEST, Inc.

Introduction

The Utah Reclamation Mitigation and Conservation Commission (URMCC) is proposing to restore the historic Provo River Delta at Utah Lake (project area) in Utah County, Utah. The project area has been altered through the construction of the Utah Lake levee, installation of a large-scale drainage system behind the levee, channelization of the Provo River, and intensive agricultural activities including grazing. The project would involve restoring the natural meandering Provo River channel through the historic river delta and removing the existing flood control levee on the Utah Lake shoreline. The completed project would allow the restored river and Utah Lake to resume natural flood cycles within the project area. The purpose of the project is to restore critical habitat for the federally endangered June sucker (*Chasmistes liorus*).

Despite existing alterations, the project area contains wetlands that are supported by a high groundwater table and slope drainage. These altered wetlands continue to provide a measurable amount of ecological function to the existing ecosystem. The U.S. Army Corps of Engineers (USACE) requested that the URMCC evaluate and quantify the ecological function provided by project area wetlands as they currently exist. The existing ecological functions can then be compared with the post-project level of the restored ecological functions, to quantify the expected change.

The Utah Department of Transportation (UDOT) developed a Wetland Functional Assessment Method and published a handbook of the method for public use in April 2006. The UDOT assessment is commonly used in Utah and has been approved by the USACE regional office in Bountiful, Utah. BIO-WEST, Inc., on behalf of the URMCC, delineated the project area wetlands and gathered the necessary field data to perform a wetland functional assessment of the project area using the UDOT method. In addition to the field data that was gathered, the UDOT manual requires site-specific input from the U.S. Fish and Wildlife Service (USFWS) and Utah Department of Wildlife Resources (UDWR) for completion of the functional assessment. This summary is intended to provide these agencies with the information required to complete applicable sections of the project area functional assessment.

Approximately 248 acres of the project area were evaluated in 2011. This evaluation included consultation with USFWS and UDWR. At the time of the 2011 evaluation BIO-WEST personnel were not allowed access to approximately 265 acres of the project area known as the Despain parcel. Evaluation of the Despain parcel was completed by observing conditions in the parcel from adjacent lands. The 2011 summary report to the agencies described 201 acres of wetlands within the Despain parcel and identified those wetlands as I1 and I2. In August 2012 BIO-WEST was allowed access to the Despain parcel for the purposes of delineating and performing a functional assessment of those wetlands. As a result of the 2012 site visit, it was determined that the Despain parcel contains 181.2 acres of wetlands that were divided into 21 separate areas for the functional assessment evaluation. The evaluation did not include 7.9 acres of excavated drainage ditches on the Despain parcel. This summary report describes the Despain parcel wetlands.

March 12, 2013

The information provided in this summary includes:

- a photograph (when available) and brief description of each assessed wetland area;
- a location map of the assessed wetlands;
- selected pages from the UDOT assessment handbook for use in agency responses to questions 12, 15c, 15d, and 15g;
- a spreadsheet summary of the assessed wetland scoring with the agency-required response columns highlighted.

Should you have questions about this summary or require additional information, please contact Mr. Mark Holden of the URMCC.

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March 12, 2013

Wetland I1.

Wetland Size: 32.3 acres

Wetland Classification: Depressional



Summary: Wetland I1 is a depressional wetland disconnected from Utah Lake by the Utah lake levee. The vegetation is dominated by chairmaker's bulrush (*Schenoplectus americanus*), common spikerush, (*Eleocharis palustris*), and spotted ladysthumb (*Polygonum persicaria*). The disturbance level is high due to frequent grazing activity and hydrologic alterations. The wetland is semi-permanently flooded. The hydrology of the wetland is controlled via a system of irrigation canals and, during high water years, the wetland is drained by pumping excess water into Utah Lake. Wetland I1 was likely a marshy lacustrine fringe wetland prior to construction of the Utah Lake levee. Wetland I1 did not appear to contain suitable habitat for Ute lady's tresses (*Spiranthes diluvialis*).

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Wetland I2.

Wetland Size: 24.7 acres

Wetland Classification: Depressional



Summary: Wetland I2 is a depressional wetland disconnected from Utah Lake by the Utah lake levee. Wetland I2 is separated from Wetland I1 by a drainage ditch. The vegetation is dominated by chairmaker's bulrush, water sedge (*Carex aquatilis*), and saltgrass (*Distichlis spicata*). Other species found in the wetland include lambsquarters (*Chenopodium album*) and scratchgrass (*Muhlenbergia asperifolia*). The disturbance level is high due to frequent grazing activity and hydrologic alterations. The hydrology of the wetland is controlled via a system of irrigation canals and, during high water years, the wetland is drained by pumping excess water into Utah Lake. Wetland I2 was likely a marshy lacustrine fringe wetland prior to construction of the Utah Lake levee. Wetland I2 did not appear to contain suitable habitat for Ute lady's tresses.

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Wetland I3.

Wetland Size: 15.9 acres

Wetland Classification: Depressional



Summary: Wetland I3 is a depressional, ephemeral wet meadow. The wetland is located adjacent to a canal along the Utah Lake levee. It is dominated by saltgrass and foxtail barley (*Hordeum jubatum*). Additional species include lambsquarters and western wheatgrass (*Pascopyrum smithii*). The disturbance level is high due to frequent grazing activity within the wetland. The hydrology is controlled by a series of irrigation pumps and canals and the area is frequently drained for agricultural use. Wetland I3 was likely a marshy lacustrine fringe prior to construction of the Utah Lake levee. Wetland I3 did not appear to contain suitable habitat for Ute lady's tresses.

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Wetland I3B.

Wetland Size: 0.1 acre

Wetland Classification: Depressional (No Photo Available)

Summary: Wetland I3B is a depressional, ephemeral wet meadow. The wetland is located within the restored 16.85-acre Provo City mitigation area. It is dominated by reed canarygrass (*Phalaris arundinacea*), saltgrass, and foxtail barley. Wetland I3B is a restored wetland that is isolated from the Despain parcel by a fence. The fence prevents grazing and the disturbance level is low. The hydrology of the wetland has been altered and the surrounding wetlands are drained through a series of irrigation canals. During high water years water is pumped out of the wetland to Utah Lake to limit flooding and allow grazing of the surrounding Despain parcel. Wetland I3 did not appear to contain suitable habitat for Ute lady's tresses.

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Wetland I4.

Wetland Size: 28.0 acres

Wetland Classification: Depressional



Summary: Wetland I4 is a depressional, ephemeral wet meadow. The wetland is located adjacent to a canal along the Utah Lake levee. It is dominated by lambsquarters, saltgrass, and foxtail barley. Additional species include western wheatgrass. The disturbance level is high due to frequent grazing activity within the wetland. The hydrology is controlled by a series of irrigation pumps and canals and the area is frequently drained for agricultural use. Wetland I4 was likely a marshy lacustrine fringe wetland prior to construction of the Utah Lake levee. Wetland I4 did not appear to contain suitable habitat for Ute lady's tresses.

Wetland I5.

Wetland Size: 30.2 acres

Wetland Classification: Depressional



Summary: Wetland I5 is a depressional, seasonally flooded wet meadow. The vegetation is dominated by common spikerush and rough cocklebur (*Xanthium strumarium*). Additional species include chairmaker's bulrush and lambsquarters. The disturbance level within this wetland is high due to frequent grazing activity and significant infestation of invasive species. The hydrology is controlled by a series of irrigation pumps and canals and the area is frequently drained for agricultural use. Wetland I5 was likely a wet meadow or forested lacustrine fringe prior to construction of the Utah Lake levee. Wetland I5 did not appear to contain suitable habitat for Ute lady's tresses due to the high cover of rough cocklebur.

Wetland I6.

Wetland Size: 7.6 acres

Wetland Classification: Depressional



Summary: Wetland I6 is an emergent wetland with a mix of native and nonnative species dominated by annual ragweed (*Ambrosia artemisiifolia*), spotted joe pye weed (*Eupatorium maculatum*), hardstem bulrush (*Schoenoplectus acutus*), meadow fescue (*Schedonorus pratensis*), Nuttall's sunflower (*Helianthus nuttallii*), common threesquare (*Schoenoplectus pungens*), wild mint (*Mentha arvensis*), spearmint (*Mentha spicata*), spotted ladysthumb, water knotweed (*Polygonum amphibium*), redtop (*Agrostis gigantea*), and quackgrass (*Elymus repens*). The disturbance level is high due to heavy grazing, several drainage ditches, and other structures. The hydrology is controlled by a series of irrigation pumps and canals and the area is frequently drained for agricultural use. The soils are organic and hydrology is seasonal freshwater. Wetland I6 does appear to contain suitable habitat for Ute lady's tresses; however, the species has not been documented here and was not observed during the site visit.

Wetland I7.

Wetland Size: 2.4 acres

Wetland Classification: Depressional



Summary: Wetland I7 is an ephemeral forested wetland. The dominant vegetation consists of eastern cottonwood (*Populus deltoides*), rough cocklebur, and water sedge, along with common spikerush, arctic rush (*Juncus arcticus*), and lambsquarters. The disturbance level is high due to heavy grazing and adjacent drainage ditches. The hydrology is controlled by a series of irrigation pumps and canals and the area is frequently drained for agricultural use. This wetland is near known Ute lady's tresses habitat (Wetlands I14 and I8); however, 2 years of surveys were performed in the area and the plant was not observed within wetland I7.

March 12, 2013

Wetland I8.

Wetland Size: 0.5 acre

Wetland Classification: Slope (Raised Fen)



Summary: Wetland I8 is representative of two seasonally persistent raised fen wetlands with peat soils. The vegetation is dominated by beaked spikerush (*Eleocharis rostellata*), water sedge, arctic rush, and chairmaker's bulrush. Additional species include rough cocklebur, small flower paintbrush (*Castilleja exilis*), and common threesquare. The disturbance level is high due to grazing and hydrologic alteration. The hydrology is controlled by a series of irrigation pumps and canals and the area is frequently drained for agricultural use. This wetland is documented habitat for Ute lady's tresses.

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Wetland I9.

Wetland Size: 0.4 acre

Wetland Classification: Slope (Raised Fen)



Summary: Wetland I9 is a seasonally persistent raised fen with peat soils. The vegetation is dominated by beaked spikerush, chairmaker's bulrush, and common spikerush. Additional species include spearmint, creeping bentgrass (*Agrostis stolonifera*), and water sedge. The disturbance level is high due to grazing activity and hydrologic manipulation from irrigation pumps and associated ditches. A documented Ute lady's tresses population occurs in Wetland I9 with one individual observed during 2012 surveys.

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Wetland I10.

Wetland Size: 0.4 acre

Wetland Classification: Slope (Raised Fen)



Summary: Wetland I10 is a seasonally persistent raised fen with peat soils. The vegetation is dominated by beaked spikerush and clustered field sedge (*Carex praegracilis*). Additional species include common spikerush, water sedge, annual rabbitsfoot grass (*Polypogon monspeliensis*), and marsh verbena (*Verbena hastata*). The disturbance level is high due to grazing activity and hydrologic manipulation from irrigation pumps and associated ditches. Ute lady's tresses populations have been documented within this habitat type. No occurrences of Ute lady's tresses were documented within Wetland I10 in 2012.

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Wetland I11.

Wetland Size: 1.1 acres

Wetland Classification: Depressional



Summary: Wetland I11 is an ephemeral forested wetland with peat soils located adjacent to the Utah Lake levee. The vegetation consists solely of a stand of mature eastern cottonwood trees. There is little to no ground cover within the wetland due to extensive trampling by cattle. The disturbance level is high as a result of hydrologic manipulation and heavy grazing activity. The hydrology is controlled by a series of irrigation pumps and canals and the area is frequently drained for agricultural use. Wetland I11 does not contain suitable habitat for Ute lady's tresses.

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Wetland I12.

Wetland Size: 1.2 acres

Wetland Classification: Slope (Raised Fen)



Summary: Wetland I12 is a seasonally persistent raised fen with peat soils. The vegetation is dominated by Canada thistle (*Cirsium arvense*). Additional species include spearmint, spotted joe pye weed, reed canarygrass, and broadleaved pepperweed (*Lepidium latifolium*). The wetland is located immediately adjacent to an irrigation canal and the Utah Lake levee. The disturbance level is high due to heavy grazing and hydrologic manipulation. The wetland is drained for agricultural purposes. Wetland I12 did not appear to contain suitable habitat for Ute lady's tresses due to heavy weed infestation.

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Wetland I13.

Wetland Size: 0.9 acre

Wetland Classification: Slope (Raised Fen)



Summary: Wetland I13 is a seasonally persistent raised fen with peat soils. The vegetation is dominated by annual ragweed and Canada thistle. Additional species include spearmint, spotted joe pye weed, reed canarygrass, and broadleaved pepperweed. The wetland is located immediately adjacent to the Utah Lake levee. The disturbance level is high due to heavy grazing and hydrologic manipulation. The wetland is regularly drained for agricultural purposes. Wetland I13 did not appear to contain suitable habitat for Ute lady's tresses due to the high percent cover of tall weedy species.

March 12, 2013

Wetland I14.

Wetland Size: 18.8 acres

Wetland Classification: Depressional



Summary: Wetland I14 is a depressional marsh wetland disconnected from Utah Lake by the Utah lake levee. The vegetation is dominated by water sedge and creeping bentgrass. Other species found in the wetland include arctic rush, jointleaf rush (*Juncus articulatus*), strawberry clover (*Trifolium fragiferum*), annual ragweed, and Ute lady's tresses. The disturbance level is high due to frequent grazing activity. The wetland is semi-permanently flooded. However, the hydrology of the wetland is controlled via a system of irrigation pumps and canals and is often drained for agricultural use. A population of Ute lady's tresses was documented in I14 during the 2012 field survey.

March 12, 2013

Wetland I15.

Wetland Size: 0.2 acre

Wetland Classification: Depressional



Summary: Wetland I15 is an ephemeral wet meadow isolated by cultivated farm fields. The vegetation is dominated by a mixture of native and nonnative species including western wheatgrass, foxtail barley, strawberry clover, and western seapurslane (*Sesuvium sessile*). The disturbance level is high due to cultivation and grazing associated with the property surrounding the wetland. Wetland I15 did not appear to contain suitable habitat for Ute lady's tresses.

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Wetland I16.

Wetland Size: 0.1 acre

Wetland Classification: Depressional (No Photo Available)

Summary: Wetland I16 is a depressional marsh located at the corner of Boat Harbor Drive and the Despain parcel driveway. The vegetation is dominated by cattail (*Typha* spp.) and reed canarygrass. The wetland is accessible to cattle but does not appear to be heavily impacted by grazing. Hydrology for this wetland may be tied to an irrigation ditch but is not connected to a natural water body. Wetland I16 does not appear to contain suitable habitat for Ute lady's tresses.

Wetland I17.

Wetland Size: 3.1 acres

Wetland Classification: Slope (Raised Fen)



Summary: Wetland I17 is a series of restored seasonally persistent raised fens with peat soils located in the Provo City mitigation area. The vegetation is dominated by Canada goldenrod (*Solidago canadensis*), arctic rush, common spikerush, small flower paintbrush, and spearmint. There is very little disturbance within the wetland as it is fenced off to prevent grazing and other agricultural impacts. The surrounding wetland hydrology is controlled by a series of pumps and canals in an effort to drain wetlands and allow grazing on the Despain parcel. Wetland I17 is documented habitat for Ute lady's tresses.

Wetland I18.

Wetland Size: 1.9 acres

Wetland Classification: Depressional



Summary: Wetland I18 is an ephemeral wet meadow located within the Provo City mitigation area. The vegetation is dominated by reed canarygrass. The disturbance in the wetland is minimal as it is surrounded by a low berm and fenced to prevent grazing activity. The surrounding wetland hydrology is controlled by a series of pumps and canals in an effort to drain wetlands and allow grazing on the Despain parcel. Wetland I18 did not appear to contain suitable habitat for Ute lady's tresses due to the high cover of reed canarygrass.

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Wetland I19.

Wetland Size: 7.3 acres

Wetland Classification: Depressional



Summary: Wetland I19 is a restored depressional marsh located within the Provo City mitigation area. The vegetation is dominated by hardstem bulrush, cattail, common duckweed (*Lemna minor*), arctic rush, and common spikerush. The disturbance level is minimal as the wetland is surrounded by a low berm and fenced off from the adjacent grazing pastures. The wetland is semi-permanently flooded. The surrounding wetland hydrology is controlled by a series of pumps and canals in an effort to drain wetlands and allow grazing on the Despain parcel. Wetland I19 does not appear to contain suitable habitat for Ute lady's tresses.

March 12, 2013

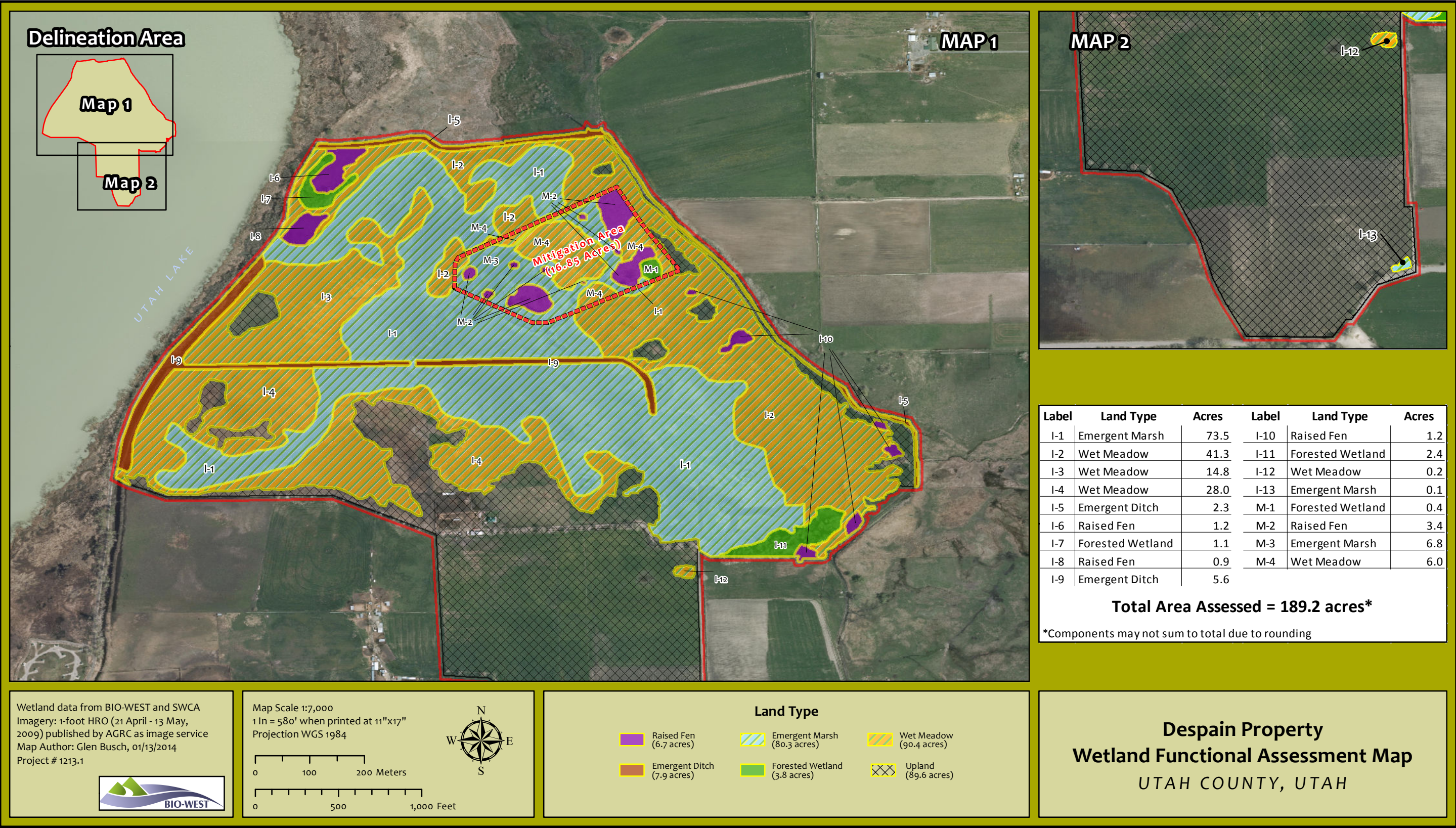
Wetland I20.

Wetland Size: 4.2 acres

Wetland Classification: Depressional



Summary: Wetland I20 is an ephemeral wet meadow located within the Provo City mitigation area. It is dominated by reed canarygrass with some western wheatgrass. Disturbance within the wetland is minimal as the entire mitigation area is surrounded by a low berm and fenced off from adjacent grazing pastures. The surrounding wetland hydrology is controlled by a series of pumps and canals in an effort to drain wetlands and allow grazing on the Despain parcel. Wetland I20 does not appear to contain suitable habitat for Ute lady's tresses.



UDOT

Utah Department of Transportation

Wetland Functional Assessment Method

Prepared for Utah Department of Transportation



April 2006



UDOT

Utah Department of Transportation

Wetland Functional Assessment Method

Prepared for Utah Department of Transportation

April 2006

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David Frey

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THE ASSESSMENT FORM

1. Project Name

Enter the appropriate project name.

2. Project Number

Enter the appropriate project number, if applicable.

3. USCOE Permit Number and Project Pin Number: Enter the appropriate control numbers, if applicable.

4. Evaluation Date

Enter the date(s) that the field evaluation was conducted.

5. Evaluating Agency

Fill in the appropriate agency (for UDOT projects, this will generally be "UDOT")

6. Evaluator(s)

Enter the names and/or affiliation of the personnel conducting the evaluation.

7. Purpose of Evaluation

Check the appropriate project category.

8. Wetland/ Site Number(s)

Enter the wetland identification number(s) e.g., Fish Creek), if applicable.

9. Wetland Location(s)

Enter the appropriate ecoregion, watershed, county, legal description, stationing or mileposts and the eight-digit watershed descriptor (U.S. Department of the Interior, U.S. Geological Survey 2002, <http://ut.water.usgs.gov/gis/hub.html>), global positioning satellite (GPS) reference number (if available, not required), and other desired location information for the evaluated wetlands.

10. Wetland Size

Enter the estimated or measured (not required) size of the entire wetland that includes the assessment area (AA). If the AA is delineated such that the entire wetland is included, the responses to 8 and 9 will be the same. If evaluating more than one AA on a single data form, enter the average wetland size or the range of wetland sizes.

11. Assessment Area (AA)

Indicate the estimated or measured (not required) acreage within the boundaries of the AA using the guidance below. If splitting a wetland into more than one AA, indicate the AA boundaries on the wetland

delineation map. Wetlands bisected by roads are considered as a single AA. If evaluating more than one AA another data form will be needed. Several example Assessment Areas relative to highway projects are provided in Appendix B.

The AA includes only the portion of delineated jurisdictional wetland that is within a proposed project zone, right-of-way, construction easement, permit area, known detour area, etc.

11a Expanded Assessment Area (EAA)

This area is determined by extending all boundaries of the AA (the portion of the delineated jurisdictional wetland that is within a proposed project zone, right-of-way, construction easement, permit area, known detour area, etc. to a distance of 600 feet. Wetlands with open water that have not been delineated as jurisdictional wetland, apply A or B to determine the EAA.

A contiguous up and downstream from the project to physical points of significant hydrologic change (natural [geomorphic] or man made constrictions or expansions, points where the gradient changes rapidly, points of significant inflow) [e.g., tributaries] or places where other factors limit hydrologic interaction or

B contiguous up and downstream from the project to a maximum distance of 600 feet if no points of significant hydrologic change (including termination of the wetland) occur within this radius.

This "expanded" area is used to evaluate contextual factors such as level of disturbance that may affect wetland function. For riverine wetlands the EAA is extended 600 feet perpendicular to the stream channel and is extended upstream and downstream as determined by A or B.

12. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals and State Listed S1 Species

A "red flag" attribute, this field assesses habitat for species receiving protection under provisions of the Endangered Species Act; that is, listed or proposed threatened or endangered species. Potential effects to threatened and endangered species are examined by the COE during 404 permit application reviews. According to the COE general conditions for Nationwide 404 permits, "no activity is authorized which is likely to jeopardize the continued existence of a threatened or endangered species or a species

proposed for such designation, as identified under the Endangered Species Act or which is likely to destroy or adversely modify the critical habitat of such species". The most current list of threatened and endangered species for Utah and state listed S1 species can be found at: <http://dwrcdc.nr.utah.gov/ucdc/> Presence must be observed and recorded by a qualified observer. State listed S1 (although S1 species do not receive protection by statute they should be given special consideration) species should also be considered in Step 12. It is recommended that the evaluator contact the U. S. Fish and Wildlife Service with regard to presence or absence of threatened or endangered species and UDWR for presence or absence of state listed S1 species.

Primary Habitat: Habitat essential to the short or long-term viability of individuals or populations. The presence of traditional breeding, spawning, nesting, denning or critical migratory habitat, large seasonal congregations (including communal roosts, staging habitat, traditional foraging congregations, etc.), or USFWS or UDWR - designated critical habitat or core areas in the AA indicates primary habitat, as does any occurrence of a T&E plant or S1 species. If T&E or S1 species habitat is documented at the AA, indicate the source of the documentation.

As previously noted, if the project site is documented habitat for TorE species or state listed S1 species it is assigned to the Red Flag Category. In cases where threatened or endangered species are involved and formal consultations are required, the FWS will respond to the action agencies Biological Assessment with their own Biological Evaluation. The Biological Evaluation will identify "reasonable and prudent" conservation alternatives from which UDOT or the consulting agency can select, or serve as a basis for negotiating an alternative amenable to all parties. If the AA is not documented primary habitat for threatened or endangered species or state listed S1 species and the AA is not automatically classified in the Red Flag Category, it may nevertheless be an important habitat component for them. Thus in question 15c, the evaluator will be asked to determine whether the AA is primary suspected habitat, secondary documented or suspected habitat, or incidental habitat for threatened or endangered species or S1 species.

13. Selecting a Wetland Classification

Wetland classes found in Utah are riverine, slope, depressional, mineral flats, and lacustrine. A classification hierarchy showing systems, subsystems, classes and subclasses for Utah Wetland Classification (UWC) is provided in Keate (2004) Appendices D and E.

For number 13, enter the UWC that applies to the AA using the UWC (Keate 2004) classification system.

Note: topographic maps and aerial photographs should be studied prior to field evaluation to assist in determining wetland classification.

- ❑ **Riverine wetlands:** Occur in floodplains and riparian corridors in association with stream channels. Water source is river or stream flow or overbank flow at peak hydrological periods. (Overbank flow should occur once every two years or 50% of the time. If flooding does not occur at this minimal rate, it is probably not a riverine based wetland). Dominant hydrodynamics are unidirectional and horizontal. A subsurface hydraulic connection between the wetland and stream does not necessarily indicate a riverine system.
- ❑ **Slope wetlands:** Occur at points of surface changes, breaks in slope or stratigraphic changes. Surface water runoff and groundwater outflow (i.e. – spring or seep) are the primary water sources. Water flow is unidirectional (down slope/gradient). Water may discharge to a stream, lake or depression. Wetland complexes can be comprised of a slope wetland with several depressions or low-points interspersed throughout. Relying on topographic maps, aerial photographs, and field evaluation will help determine which classification is dominant and or most appropriate.
- ❑ **Depressional wetlands:** Occur in topographic depressions with closed contours. Water sources are precipitation, runoff and groundwater. Water flow vectors are toward the center of the depression. Dominant hydrodynamics are vertical. May or may not have inlets or outlets. Depressions that are full, may release water down slope/gradient and tend to be a part of a larger slope complex. Relying on topographic maps, aerial photographs, and field evaluation will help determine which classification is dominant and or most appropriate.
- ❑ **Mineral Flat wetlands:** Occur on large relict lakebeds. Dominant water source is precipitation. Dominant hydrodynamics are

vertical. Typically are large features in the landscape, associated with old Lake Bonneville bottom deposits with close proximity to GSL or other large permanent, semi-permanent or ephemeral water bodies. (e.g. – Sevier Lake) Only found in basin and range ecoregions. Example: Great Salt Lake mud flats and salt flats. Subclasses are not known.

- ❑ **Lacustrine Fringe wetlands:** Occur adjacent to large lakes and reservoirs. Dominant water source is lake water level. Hydrodynamics are bi-directional. Subject to waves and seiches.
- ❑ **Roadside Ditch Wetland:** Any non-jurisdictional wetland <30 feet in width that exists in its entirety within the highway ROW, is an excavated upland and is not connected to any other jurisdictional wetland. Its primary source of hydrology is runoff from the road surface, irrigation overflow, irrigation ditch leakage or non-point surface runoff from an adjacent urbanized area. In addition, to qualify as a roadside ditch wetland the wetland of concern must **not** convey water to any adjacent natural stream, spring or natural or created wetland outside the ROW and must not contain any threatened or endangered species.

14. Subclassification

Identify the subclass, soil type, pH range and water salinity if applicable to the particular wetland class. For detailed subclass information for see Appendices D and E.

15a Level of Disturbance

Disturbance: This field assesses the level of disturbance within the wetland (AA) and the level of disturbance within the expanded assessment area (EAA). The EAA is a 600 foot buffer around the perimeter of the AA. Disturbance at the AA is defined based on land use both at the AA and in the surrounding area (EAA). Land use in surrounding areas can provide a measure of disturbance within AAs and negatively influence their habitat quality even though the AAs themselves may be relatively undisturbed.

Circle the description of the level of disturbance that most closely reflects conditions observed within the AA and the EAA.

Comments: Provide a brief (1 to 2 sentence) descriptive summary of the AA and surrounding area. The description may include dominant species, adjacent land use, proximity to other wetlands, etc.

15b Plant Community Composition

Using the table provided in Appendix G to determine plant community composition for the AA. Plant community composition is defined as layers of vegetation (riverine and lacustrine only), percent ground coverage dominated by native wetland vegetation within the entire AA, and the percent of native wetland to non-native or non-wetland plant species. Observation is used determine layers of vegetation (riverine and lacustrine only) as well as to estimate percent ground cover dominated by native wetland species in the AA. Estimates of each of these factors are compared with reference standard sites with subclasses as described by Keate (2004) for slope, depressional, and mineral flat wetland classes. (see Appendices D, E and F for lists of dominant native vegetation, photographs, plans and cross sections). Reference standard sites for riverine and lacustrine were developed from research by Pagette et al. (1989). For riverine and lacustrine wetlands, first determine site elevation then reference Appendix F.

The native wetland to non-native or non-wetland plant percent is obtained by using transect sampling procedures detailed in Appendix G. The evaluator divides the total number of native wetland plant species by the total number of plants observed.

It is important to note that in some circumstances it may not be possible to conduct a transect protocol as described in Appendix G. For example, heavily wooded areas along a riverine corridor, small size of the AA or fragmented pieces of jurisdictional wetland scattered over the project site. In these circumstances the evaluator(s) should visually assess the vegetation and use their best professional judgment.

15c Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals

This field assesses primary suspected, secondary documented or suspected or incidental documented or suspected use of the AA by federally listed or proposed threatened or endangered species, or documents the AA as unsuitable habitat for threatened or endangered species.

i. Circle S to indicate whether habitat for listed or proposed TorE species is suspected within the AA at the ascertained level using the definitions provided below. It may be appropriate to indicate more than one use level for multiple species. For example, an AA may contain secondary habitat for bald eagles and incidental habitat for peregrine falcons. List the

species that correspond to each habitat level determined to apply to the AA.

Secondary Habitat:

Habitat that is occasionally or semi-regularly used by a given species, but that is not necessarily essential to the short or long-term viability or individuals or populations. Examples would include non-specific migration areas and occasional forage or perch sites. Primary habitat, as defined above, may occur in the general vicinity (e.g., within the project area, EAA, section, drainage, watershed, etc.), but not in the AA.

Incidental Habitat:

Habitat that receives chance, inconsequential use by a given species or habitat conditions or the known distribution of the species would indicate this level of use. This term implies that, while it may be conceivable that a given species may occur at an AA at a given point in time, the chance is remote and the use is not likely to be repeated.

ii. Rating: Use the highest level habitat (e.g., the level that corresponds to the highest functional point value) determined under **i** to determine the functional point value for the AA. If the AA is not documented Primary Habitat for threatened or endangered species and the AA is not automatically classified as a Category I, it may nevertheless be an important habitat component for them. Thus in question 15c, the evaluator will be asked to determine whether the AA is secondary or incidental habitat for threatened and endangered species.

15d Habitat for Plants or Animals Rated S1, S2, or S3 by the Utah Natural Heritage Program

This field assesses use of or existence in the AA by species rated S2 (imperiled), or S3 (vulnerable) by the UNHP (not including “watch list” species). S1 (critically imperiled) species would have been placed in the Red Flag Category in Step 12. Species within these UNHP categories are inclusive of U.S. Forest Service-listed sensitive species and FWS candidate species that are not subject to the provisions of the Endangered Species Act. To avoid duplication, do not include species listed above under 12 and 15c. Evaluators are encouraged to contact the Utah State University Herbarium (435) 797-1584 if they have T or E plant identification questions. Contact UDWR (801) 538-4700 for plant and wildlife questions and documentation.

i. Circle D or S to indicate whether habitat for these species is documented or suspected within the AA at the ascertained level using the definitions provided

above under 12 and 15c or in the glossary. As discussed in 12, it may be appropriate to indicate more than one habitat level for multiple species. List the species that correspond to each habitat level applying to the AA.

ii. Rating: Use the highest level habitat (e.g., the level that corresponds to the highest functional point value) determined under **i** to determine the functional point value for the AA. If sensitive species habitat is documented at the AA, indicate the source of the documentation.

15e General Wildlife Habitat

This field assesses general wildlife habitat potential within the AA based upon documentation of wildlife use and habitat features. The combination of these two variables is considered to more accurately assess this function than if habitat features alone were used. A site may contain what are perceived to be outstanding habitat features for wildlife, but for reasons difficult to detect (such as presence of toxins, etc.) may only receive minimal to moderate use. Opportunities for enhancement may exist if such a situation were correctable. Conversely, a site may contain few desirable habitat features, but may receive significant use due to a general lack of habitat in the area or other factors and may be under-rated for this function if documented wildlife use was not considered.

Degree of disturbance at a wetland and in the adjacent landscape can greatly influence its use by wildlife. Examples of disturbance include direct conversion, conversion of upland supporting habitats, and encroachment and fragmentation by human activity sources, such as buildings, trails, roads, canals and ditches.

Plant community composition relates to the number of niches in a wetland class as well as its vertical and horizontal structural characteristics as described in the reference standard site. More niches are potentially available as more layers of habitat occur within the range of expected layers for native vegetation and structural characteristics in a given wetland class, so more wildlife species potentially are supported by more structurally complex habitats.

ii. Wildlife Habitat Features: Working from top to bottom within the double vertical lines, circle the appropriate AA attributes in the matrix provided on the data form to arrive at a high (H), moderate (M), or low (L) rating. The first variable considered is the

level of disturbance. The second variable is plant community composition.

Modified Habitat Quality Rating: Consult with the UDWR regional wildlife biologist to determine the level of wildlife use in the AA.

Circle “high” “moderate” or “low” level of use based on the data collected and following consultation with the UDWR regional biologist. For further guidance, refer to the definitions of high, moderate or low to no use provided below. Evidence of use is considered to be indicative of level of use.

High use:

AA is regularly used in high numbers relative to local or transient populations.

Moderate use:

AA is regularly used in small to moderate numbers relative to local populations, or infrequently or sporadically used in any numbers relative to local or transient populations.

Low to No use:

AA regularly, infrequently or sporadically used by extremely small numbers relative to local populations, or receives chance, inconsequential use in any numbers relative to local or transient populations.

iii. Rating: Determine and circle the general wildlife habitat rating and functional points for the AA by applying the results of **i** and **ii** to the matrix provided in the data form.

15f General Fish/ Aquatic Habitat

This field assesses general fish and aquatic habitat at the AA based upon the presence of certain groups of fish and habitat features. In Utah this only applies to riverine and lacustrine wetlands. Assess this function only if the AA is used by fish or the existing situation is “correctable” such that the AA could be used by fish (e.g., fish use is precluded by perched culvert or other barrier, etc.). If the AA is not or was not historically used by fish due to lack of habitat (including duration of surface water), excessive gradient, etc. (e.g., the AA does not have the opportunity to provide habitat for fish), circle **NA** where indicated on the data form and proceed to the next function. The maximum duration of surface water (any water above the ground surface that is available to wildlife; not necessarily open water) covering at least 10% of the AA. The 10 percent criterion should be considered a rule of thumb and is

intended to be applied primarily at smaller (e.g., less than 1 or 2 acres), rather than larger sites. For example, 9 acres of surface water should not be dismissed at a 100-acre AA simply because this 10 percent guidance is not met. The intent of this criterion is to allow consideration of significant surface water amounts within an AA relative to fish habitat, while disallowing insignificant surface water amounts. The final call will depend on the specific situation at hand, and is therefore left to the evaluator. Abbreviations for surface water durations are as follows: P/P = permanent/ perennial; S/I = seasonal/ intermittent; T/E = temporary/ ephemeral; and A = absent where:

Permanent/ perennial:

Surface water is present throughout the year except during years of extreme drought.

Seasonal/ intermittent:

Surface water is present for extended periods, especially early in the growing season, or may persist throughout the growing season, but may be absent at the end of the growing season; or surface water does not flow continuously, as when water losses from evaporation or seepage exceed the available stream flow.

Temporary/ ephemeral:

Surface water is present for brief periods during the growing season, but the water table is well below the surface for most of the year; or surface water flows briefly in response to precipitation in the immediate vicinity and the channel is above the water table.

Variables assessed to determine a rating for habitat quality include duration of surface water, structural cover, shading, and habitat availability. Presence of surface water is an obvious critical component of fish habitat. Seasonally flooded areas can be important nursery and foraging areas for fish (and can result in “high” habitat quality ratings using this assessment); however, longer duration of surface water generally results in higher ratings because surface waters of such duration are available to fish for greater periods and varieties of life stages. Flow or water level stability is an important habitat component for a variety of fish species.

Abundant structural cover and well-vegetated stream banks and shorelines are also important habitat components for several fish species. Structural cover such as submerged logs and vegetation, other woody debris, floating-leaved vegetation, and large rocks provides resting areas, refuge from predators, hiding areas from predators, and functions as a substrate for

insect larva; an important food source for many fish species. High water temperatures that result from removal of streamside vegetation can render habitat as unsuitable for fish that are sensitive to higher temperatures, such as Bonneville cutthroat trout. Vegetation along streams, ponds, and lakes also provides insect habitat, an important food source for many fish species.

Although the physical habitat attributes of a site may be attractive to fish, use of the area may be significantly reduced or precluded due to the presence of inadequately sized culverts, dikes, continual sources of degradation, or other causes. Consequently, potential "habitat modifiers" are also considered in the assessment.

The presence of certain groups of fish in the AA is considered along with habitat features to derive an overall fish/ aquatic habitat rating. UDWR seeks to preserve and enhance all desirable aquatic species and their supporting ecosystems. To accomplish this UDWR continues to develop and implement policies and programs that foster sound management of wild fish populations and their habitats, at the same time that it monitors and regulates angler harvests, maintains recreational activities for anglers, and provides improved access to fisheries.

Given these management priorities (managing for wild fish populations **and** recreational opportunities), the following groups of fish are considered in the assessment in order of descending "rank:" native game sport fish; introduced game fish; non-game fish; and no fish.

As listed in the 2004 Utah Fishing Proclamation, Utah native sport fish include: Mountain, Bonneville and Bear Lake Whitefish, Bonneville Cisco and four subspecies of Cutthroat Trout, Bear Lake, Bonneville, Colorado and Yellowstone. Non-native coldwater sport species include: Rainbow Trout, Lake Trout, Brook Trout, Arctic Grayling, Kokanee Salmon and Brown Trout. Cool and warm water sport fish include: Walleye, Yellow Perch, Striped Bass, White Bass, Smallmouth Bass, Largemouth Bass, Bullhead, Channel, Catfish, Black Crappie, Green Sunfish and Bluegill. Hybrid sport fish include: Tiger Muskellunge, Tiger Trout and Splake. Non-game fish include: Carp, Utah Sucker and Utah Chub. The June Sucker is an endangered species. Threatened species and state species of concern can be found at <http://dwr.cdc.nr.utah.gov/ucdc/>.

i. Habitat Quality: Working from top to bottom within the double vertical lines, circle the appropriate AA attributes in the matrix provided on the data form to arrive at a high (H), moderate (M), or low (L) rating. The first variable considered is the maximum duration of surface water in the AA. Use the definitions provided above. The second variable is structural cover. Estimate the percentage of the waterbody within the AA that contains cover objects such as submerged logs, large rocks and boulders, overhanging banks, and submerged and floating-leaved vegetation. The final variable is shading, as determined by estimating the percent of stream bank or shoreline within the AA that contains wetland or riparian scrub-shrub or forested communities. This will determine the rating for habitat quality.

ii. Modified Habitat Quality: Circle the appropriate response to the following question: Is fish use of the AA precluded or significantly reduced by a culvert, dike, or other man-made structure or activity **or** is the waterbody included on the UDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support? If the answer is yes, then reduce the habitat quality rating determined in **i** above by .1. If the answer is no, then do not modify the habitat quality rating determined in **i**.

iii. Rating: Determine and circle the general fish/ aquatic rating and functional points for the AA by applying the results of **i** and **ii** to the matrix provided in the data form. The term "native" implies a species indigenous to Utah; not necessarily to a given drainage or water body. The evaluator is referred to *Fishes of Utah* (Sigler and Miller 1963) for the status (native vs. introduced) of fish species known or suspected to occur in the AA.

15g Amphibian Habitat

This field assesses general amphibian habitat potential at the AA. The assessment is based upon the presence of water quality and habitat characteristics that could support amphibians or document amphibian use of the AA. The level of amphibian use of the AA or the potential of the AA to support amphibians is determined through consultation with a UDWR regional biologist. If amphibians are present in the AA or habitat and water quality characteristics are such that they could support amphibians add .2 under the functional points rating column in the Functional Assessment Rating section.

PROVO RIVER DELTA RESTORATION PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT

Appendix E: Coordination Letters

**MEMORANDUM OF UNDERSTANDING
AMONG JOINT-LEAD AND COOPERATING AGENCIES**

for

**PROVO RIVER DELTA RESTORATION PROJECT
NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE**

I. INTRODUCTION

This Memorandum of Understanding (MOU) is made this 11th day of February, 2011. The Department of the Interior – Central Utah Project Completion Act Office (Interior), Utah Reclamation Mitigation and Conservation Commission (Commission), and the Central Utah Water Conservancy District (District) are proposing the Provo River Delta Restoration Project (PRDRP). The PRDRP is an environmental restoration project designed to help recover the endangered June sucker by restoring wetlands and other habitats along the lower Provo River delta and its interface with Utah Lake, Utah. The project fulfills mitigation commitments for recovery of June sucker, an endangered species, and other fish, wildlife and wetland habitat improvement goals of the Central Utah Project (CUP).

Interior, the Commission and the District are the Joint Lead agencies in complying with analysis and documentation requirements of the National Environmental Policy Act (NEPA) for the proposed project.

The following entities are Cooperating Agencies in NEPA compliance for the PRDRP:

- U.S. Bureau of Reclamation
- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers
- State of Utah
- Utah County
- Provo City

A federal, state, tribal or local agency having special expertise with respect to an environmental issue, or jurisdiction by law may be a Cooperating Agency in the NEPA process. A cooperating agency has the responsibility to assist the lead agency by participating in the NEPA process at the earliest possible time; by participating in the scoping process; in developing information and preparing environmental analyses including portions of the environmental impact statement concerning which the cooperating agency has special expertise; and in making available staff support at the lead agency's request to enhance the lead agency's interdisciplinary capabilities.

Serving as a Cooperating Agency does not constitute endorsement or approval of the project or alternatives evaluated in an Environmental Impact Statement. Rather, by participating in the NEPA process a Cooperating Agency serves to help verify the data and information used in the EIS, within their entity's jurisdiction or areas of expertise, and identify potential issues early in the planning process. Participating as a Cooperating Agency does not imply any cooperator supports or advocates any particular alternative or the project itself nor does the Cooperating Agency abrogate or subrogate any other duties or responsibilities it may have under local, state or federal law.

II. PURPOSE

The purpose of this MOU is to establish the roles and responsibilities of the Joint Lead and Cooperating Agencies with respect to NEPA compliance activities for PRDRP.

III. AUTHORITY AND REFERENCES

- A. Public Law 102-575, October 30, 1992, Central Utah Project Completion Act (CUPCA) (Titles II-VI) as amended.
- B. Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the NEPA (40 CFR Parts 1500-1508).
- C. Council on Environmental Quality, 40 Questions and Answers about the NEPA Regulations.
- D. U.S. Department of the Interior, Departmental Manual at 516 DM 2.5.
- E. U.S. Department of the Interior, National Environmental Policy Act Handbook.
- F. Executive Order 13352, August 26, 2004, Facilitation of Cooperative Conservation
- G. NEPA Implementation Procedures for the Regulatory Program (33 CFR Part 325, App. B)

IV. PROVISIONS

- A. Decisions regarding NEPA compliance document content are the ultimate responsibility of the Joint-Lead Agencies.
- B. Each party to this Agreement has an interest, jurisdiction or expertise regarding the PRDRP.

C. The Joint-Lead Agencies will:

1. Prepare and maintain schedules, public involvement, administrative documents, and will provide Cooperating Agencies with informational copies as appropriate. All agencies share responsibility to meet schedules and provide quality work.
2. Provide Cooperating Agencies advance notice of review points and time periods of no less than two weeks for review, and will further provide opportunities to review with NEPA-related products.
3. Be responsible for preparation of responses to comments on the NEPA document, but will seek assistance from Cooperating Agencies in responding to comments on issues in which the agencies have jurisdiction or special expertise.
4. Have the ultimate decision making authority for the scope and development of the NEPA document including Purpose and Need, Alternatives, Affected Environment, and Environmental Effects.
5. Prepare and sign a Record of Decision(s) based on the analysis presented in the EIS.

D. Cooperating Agencies will:

1. Participate in NEPA compliance document development and review under the regulations of the CEQ and the Cooperating Agency's NEPA implementing regulations, if applicable.
2. Designate one Principal Coordinator as a single point of contact for development of the NEPA document.
3. Provide technical information, advice, and review on topics, resources and environmental impacts including, but not limited to, those areas in which the agency has jurisdiction or special expertise as defined by CEQ. Prepare, review and edit text, responses to public comments, tables and other media as assigned by the Joint-Lead Agencies.
4. Review, comment and provide written input for all documents and review materials within mutually agreed upon timeframes set by the Joint-Lead Agencies in consultation with the Cooperating Agencies.
5. Subject to the Freedom of Information Act, (5 U.S.C. §552 as amended by Public Law No. 104-231), keep all information, data and documents provided by the Joint-Lead Agencies, and also comments associated with the Cooperating Agencies review, confidential and not available to anyone other than the parties to this (MOU), unless such

information, data, documents, comments, etc. are released to the public by the Joint-Lead Agencies.

6. Fund their respective agency's participation in meetings, data collection, studies, document preparation or review tasks under this MOU.

7. Recognize the Joint-Lead Agencies' ultimate authority and responsibility for managing the NEPA process, developing the NEPA document, and preparing their Record of Decision as to which alternative, if any, to implement.

V. OTHER RESPONSIBILITIES

Nothing in this MOU will be construed to amend or abridge the authority of the agencies to carry out their responsibilities under the provisions of the NEPA, CEQ regulations and guidance, or other specific mandates and legal responsibilities.

VI. IMPLEMENTATION AND TERMINATION

A. This Agreement is effective on the date indicated above and shall be valid for a period of 5 years. At the end of this 5-year period, this Agreement can be reviewed and if necessary reaffirmed in writing by all signatories.

B. This Agreement may be modified by letter of agreement from the Joint-Lead Agencies with the concurrence of each Cooperating Agency. Any modification shall be confirmed in writing prior to the change.

C. Any signatory party may terminate their participation in this MOU by providing written notice to all other parties, effective 60 days following the date of delivery of such notice. One or more of the Joint-Lead Agencies may terminate the Cooperating Agency status of any party to this contract as provided in guidance from CEQ.

D. This MOU does not in any manner affect statutory authorities and responsibilities of the Cooperating/Participating Agencies.

E. This Agreement may be signed in any one or more counterparts which together will constitute a binding agreement.

VII. EXECUTION ON BEHALF OF COOPERATING AND JOINT LEAD AGENCIES

JOINT LEAD AGENCIES

**Department of the Interior
CUPCA Office**



CUPCA Program Director Date 2/11/11

**Utah Reclamation Mitigation
and Conservation Commission**


Executive Director Date 2/17/11

Central Utah Water Conservancy District

Approved:


General Manager Date 2-16-2011


Regional Solicitor Date 3/17/11

COOPERATING AGENCIES

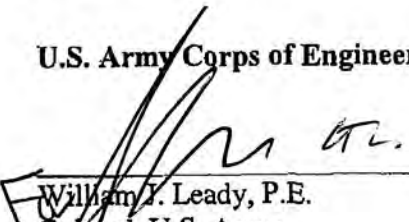
U.S. Bureau of Reclamation


Area Manager Date 2/11/11

U.S. Fish and Wildlife Service


Field Supervisor Date 2/23/11

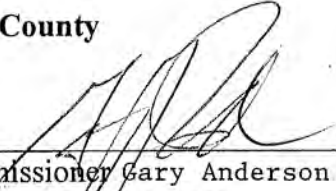
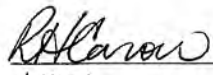
U.S. Army Corps of Engineers


William J. Leady, P.E.
Colonel, U.S. Army
District Commander Date 7 MAR 2011

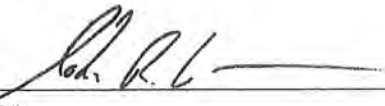
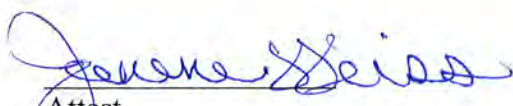
State of Utah

 2/23/11
John Harja, Director Date
Public Lands Policy Coordination Office

Utah County

 03-15-2011 
Commissioner Gary Anderson Date Attest
Commission Chairman

Provo City

 3/29/11 
Mayor Date Attest



UTAH RECLAMATION
**MITIGATION
AND CONSERVATION
COMMISSION**

230 South 500 East, Suite 230, Salt Lake City, UT 84102-2045
Phone: (801) 524-3146 Fax: (801) 524-3148

COMMISSIONERS
Jody L. Williams, Chair
Don A. Christiansen
Brad T. Barber
Dallin W. Jensen
James Karpowitz

October 20, 2010

Mr. David Wham
Utah Division of Water Quality
PO Box 144870
Salt Lake City, UT 84114-4870

Subject: Provo River Delta Restoration Project Environmental Impact Statement Kick-Off Meeting

Dear Mr. Wham:

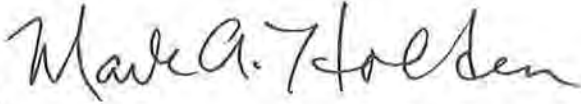
We are writing to invite your attendance at a kick-off meeting sponsored by the three Joint-Lead Agencies preparing an environmental impact statement (EIS) for the proposed Provo River Delta Restoration Project. The three Joint Lead Agencies responsible for preparing the EIS and for making subsequent decisions regarding the proposed project are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Department of the Interior – Central Utah Project Completion Act Office (Interior) and Central Utah Water Conservancy District (Central Utah). The main purposes for the meeting are to discuss participation by Cooperating Agencies, and the formation of an interdisciplinary planning team to assist the Joint Lead Agencies in preparing technical information for the EIS. The meeting will be held on November 1, 2010 at 2:00 p.m. at Central Utah's office located at 355 West University Parkway, Orem, Utah.

The Council on Environmental Quality (CEQ) defines a Cooperating Agency as an agency possessing jurisdiction by law or special expertise that is relevant to an environmental impact associated with a proposed Federal action that is subject to evaluation under NEPA (40 CFR 1508.5). The roles and responsibilities of a Cooperating Agency are set forth in the CEQ regulations at 40 CFR 1501.6. Briefly, these provide that a Cooperating Agency will participate actively in the EIS process and will, primarily, review information and analyses prepared by the joint lead agencies concerning which the Cooperating Agency has jurisdiction or special expertise.

We believe that direct participation by Utah Division of Environmental Quality in the development of the EIS will strengthen and improve the quality of the EIS. Please respond as to your attendance at the November 1 meeting, to Mr. Mark Holden at 801/524-3146 or at mholden@usbr.gov. A copy of an informational brochure about the proposed project is included for your information.

On behalf of the Joint-Lead Agencies, we appreciate your interest in the proposed Provo River Delta Restoration Project.

Sincerely,



Michael C. Weland
Executive Director

Enclosure

cc: Reed Murray Department of Interior
Gene Shawcroft Central Utah Water Conservancy District
Reed Harris Department of Natural Resources
Michael Mills Central Utah Water Conservancy District

UTAH RECLAMATION
**MITIGATION
AND CONSERVATION
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James Karpowitz

October 20, 2010

Mr. Steve Hardegen
Regional Environmental Officer
Federal Emergency Management Agency
US Department of Homeland Security, Region 8
Denver Federal Center, Building 710
P.O. Box 25267
Denver, CO 80225-0267

Subject: Provo River Delta Restoration Project Environmental Impact Statement Kick-Off Meeting

Dear Mr. Hardegen:

We are writing to invite your attendance at a kick-off meeting sponsored by the three Joint-Lead Agencies preparing an environmental impact statement (EIS) for the proposed Provo River Delta Restoration Project. The three Joint Lead Agencies responsible for preparing the EIS and for making subsequent decisions regarding the proposed project are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Department of the Interior – Central Utah Project Completion Act Office (Interior) and Central Utah Water Conservancy District (Central Utah). The main purposes for the meeting are to discuss participation by Cooperating Agencies, and the formation of an interdisciplinary planning team to assist the Joint Lead Agencies in preparing technical information for the EIS. The meeting will be held on November 1, 2010 at 2:00 p.m. at Central Utah's office located at 355 West University Parkway, Orem, Utah.

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We believe that direct participation by the Federal Emergency Management Agency in the development of the EIS will strengthen and improve the quality of the EIS. Please respond as to your attendance at the November 1 meeting, to Mr. Mark Holden at 801/524-3146 or at

mholden@usbr.gov. A copy of an informational brochure about the proposed project is included for your information.

On behalf of the Joint-Lead Agencies, we appreciate your interest in the proposed Provo River Delta Restoration Project.

Sincerely,

A handwritten signature in black ink that reads "Mike A. Weland". The signature is written in a cursive, flowing style.

Michael C. Weland
Executive Director

Enclosure

cc: Reed Murray Department of the Interior
Gene Shawcroft Central Utah Water Conservancy District
Reed Harris Department of Natural Resources
Michael Mills Central Utah Water Conservancy District

UTAH RECLAMATION
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James Karpowitz

October 20, 2010

Mr. Jason Gipson
Chief, Utah Regulatory Office
U.S. Army Corps of Engineers
533 West 2600 South, Suite 150
Bountiful, Utah 84010

Subject: Provo River Delta Restoration Project Environmental Impact Statement Kick-Off Meeting

Dear Mr. Gipson:

We are writing to invite your attendance at a kick-off meeting sponsored by the three Joint-Lead Agencies preparing an environmental impact statement (EIS) for the proposed Provo River Delta Restoration Project. The three Joint Lead Agencies responsible for preparing the EIS and for making subsequent decisions regarding the proposed project are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Department of the Interior – Central Utah Project Completion Act Office (Interior) and Central Utah Water Conservancy District (Central Utah). The main purposes for the meeting are to discuss participation by Cooperating Agencies, and the formation of an interdisciplinary planning team to assist the Joint Lead Agencies in preparing technical information for the EIS. The meeting will be held on November 1, 2010 at 2:00 p.m. at Central Utah's office located at 355 West University Parkway, Orem, Utah.

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We believe that direct U.S. Army Corps of Engineers participation in the development of the EIS will strengthen and improve the quality of the EIS. Please respond as to your attendance at the November 1 meeting, to Mr. Mark Holden at 801/524-3146 or at mholden@usbr.gov.

On behalf of the Joint-Lead Agencies, we appreciate your interest in the proposed Provo River Delta Restoration Project.

Sincerely,

Michael C. Weland



Michael C. Weland
Executive Director

cc: Reed Murray Department of Interior
Gene Shawcroft Central Utah Water Conservancy District
Reed Harris Department of Natural Resources
Michael Mills Central Utah Water Conservancy District

UTAH RECLAMATION
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Brad T. Barber
Dallin W. Jensen
James Karpowitz

October 20, 2010

Mr. Richard Clark
Wetlands and NEPA Coordinator
US EPA Region 8
1595 Wynkoop Street
Denver, CO 80202-1129

Subject: Provo River Delta Restoration Project Environmental Impact Statement Kick-Off Meeting

Dear Mr. Clark:

We are writing to invite your attendance at a kick-off meeting sponsored by the three Joint-Lead Agencies preparing an environmental impact statement (EIS) for the proposed Provo River Delta Restoration Project. The three Joint Lead Agencies responsible for preparing the EIS and for making subsequent decisions regarding the proposed project are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Department of the Interior – Central Utah Project Completion Act Office (Interior) and Central Utah Water Conservancy District (Central Utah). The main purposes for the meeting are to discuss participation by Cooperating Agencies, and the formation of an interdisciplinary planning team to assist the Joint Lead Agencies in preparing technical information for the EIS. The meeting will be held on November 1, 2010 at 2:00 p.m. at Central Utah's office located at 355 West University Parkway, Orem, Utah.

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We believe that direct U.S. Environmental Protection Agency participation in the development of the EIS will strengthen and improve the quality of the EIS. Please respond as to your attendance at the November 1 meeting, to Mr. Mark Holden at 801/524-3146 or at mholden@usbr.gov. A copy of an informational brochure about the proposed project is included for your information.

On behalf of the Joint-Lead Agencies, we appreciate your interest in the proposed Provo River Delta Restoration Project.

Sincerely,



Mark A. Holden

Michael C. Weland
Executive Director

Enclosure

cc: Reed Murray Department of Interior
Gene Shawcroft Central Utah Water Conservancy District
Reed Harris Department of Natural Resources
Michael Mills Central Utah Water Conservancy District

UTAH RECLAMATION
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230 South 500 East, #230, Salt Lake City, UT 84102
Phone: (801) 524-3146 – Fax: (801) 524-3148

COMMISSIONERS
Jody L. Williams, Chair
Don A. Christiansen
Brad T. Barber
Dallin W. Jensen
James F. Karpowitz

April 20, 2011

Mr. Larry Crist, Field Supervisor
U.S. Fish and Wildlife Service
Utah Ecological Services Office
2369 W. Orton Circle, Suite 50
West Valley City, Utah 84119

Subject: Section 7 Consultation for Actions Associated with the Provo River Delta
Restoration Project, Utah County, UT

Dear Mr. Crist:

We appreciate the valuable guidance your agency has provided throughout the planning of this project. During our meeting on February 9, 2011, we discussed how we should initiate Section 7 consultation for the project. Since that time, the U.S. Army Corps of Engineers has designated the Utah Reclamation Mitigation and Conservation Commission as the lead Federal agency for the project for purposes of compliance with Section 7 of the Endangered Species Act (letter dated March 3, 2011; enclosed). They have assigned the project identification number SPK-2010-01394-UO.

As you suggested during the meeting, we entered the project coordinates into the Information Planning and Conservation System (IPAC) database which generated the enclosed project location map. The IPAC database also generated the enclosed list of the threatened, endangered or candidate species that may be affected by the project.

The lack of suitable habitat and the urban nature of the site preclude the Canada lynx, as well as the Yellow-billed cuckoo and Greater sage grouse. Least chub are not known to occur in the project area. For these reasons, the affect of the project on these species will not be examined in detail in the Environmental Impact Statement being prepared for the project.

Ute's ladies-tresses are known to occur on the site and recovery of the June sucker is one of the project needs. For this reason, the affect of the project on these species will be examined in greater detail in the Environmental Impact Statement.

If you have any questions or require additional information, please contact Mr. Richard Mingo, Project Coordinator at 801-524-3146.

Sincerely,



Michael C. Weland
Executive Director

Enclosures

cc: Jim Karpowitz, Utah Division of Wildlife Resources
Sarah Sutherland, Central Utah Water Conservancy District
Lee Baxter, Department of the Interior
Jason Gipson, U.S. Army Corps of Engineers



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

March 3, 2011

MITIGATION COMMISSION
OFFICIAL FILE COPY
CLASSIFICATION _____
PROJECT _____
FOLDER _____ CONTROL _____

MAR - 4 2011

Regulatory Division (SPK-2010-01394-UO)

Michael Weland, Executive Director
Utah Reclamation Mitigation and Conservation Commission
230 South 500 East, Suite 230
Salt Lake City, Utah 84102-2045

CODE	INITIALS
MCD1	MCD
MCD2	
MCD4	

MCD5
MCD7

Dear Mr. Weland:

This letter concerns the designation of lead Federal agency for the proposed Provo River Delta Restoration Project. The project is located near the mouth of the Provo River and Utah Lake in Section 33, Township 6 South, Range 2 East, Salt Lake Meridian, Latitude 40.2432°, Longitude -111.7240°, Provo, Utah County, Utah.

Following early coordination with your agency on November 1, 2010, we hereby designate the Utah Reclamation Mitigation and Conservation Commission as the lead Federal agency to act on our behalf for purposes of compliance with the Section 7 of the Endangered Species Act (ESA) and Section 106 of the National Historic Preservation Act (NHPA), to include consultation with the tribes, for the Department of the Army authorization required for the Provo River Delta Restoration Project under Section 404 of the Clean Water Act.

Please provide us with contact information of the archaeologist who will be conducting the study for this project. We must coordinate and approve the Area of Potential Effect prior to the archaeologist initiating the research and site survey. We would also like to be included on correspondence regarding the Section 106 consultation.

When you initiate consultation under Section 7 of the ESA or Section 106 of the NHPA, please include a statement indicating that we have designated the Utah Reclamation Mitigation and Conservation Commission as the lead Federal agency for the project, along with a copy of this letter.

Please refer to identification number SPK-2010-01394-UO in any correspondence concerning this project. If you have any questions, please contact Tim Witman by telephone at 801-295-8380, ext. 17, by email at Timothy.R.Witman@usace.army.mil, or by mail at the Utah Regulatory Office, 533 West 2600 South, Suite 150, Bountiful, Utah 84010.

Sincerely,

Jason Sipson
Chief, Nevada-Utah Regulatory Branch



U.S. Fish and Wildlife Service

Natural Resources of Concern

This resource list is to be used for planning purposes only — it is not an official species-list.

Endangered Species Act species-list information for your project is available online and listed below for the following FWS Field Offices:

UTAH ECOLOGICAL SERVICES FIELD OFFICE
2369 WEST ORTON CIRCLE, SUITE 50
WEST VALLEY CITY, UT 84119
(801) 975-3330
<http://www.fws.gov>
<http://www.fws.gov/utahfieldoffice/>

Project Name:

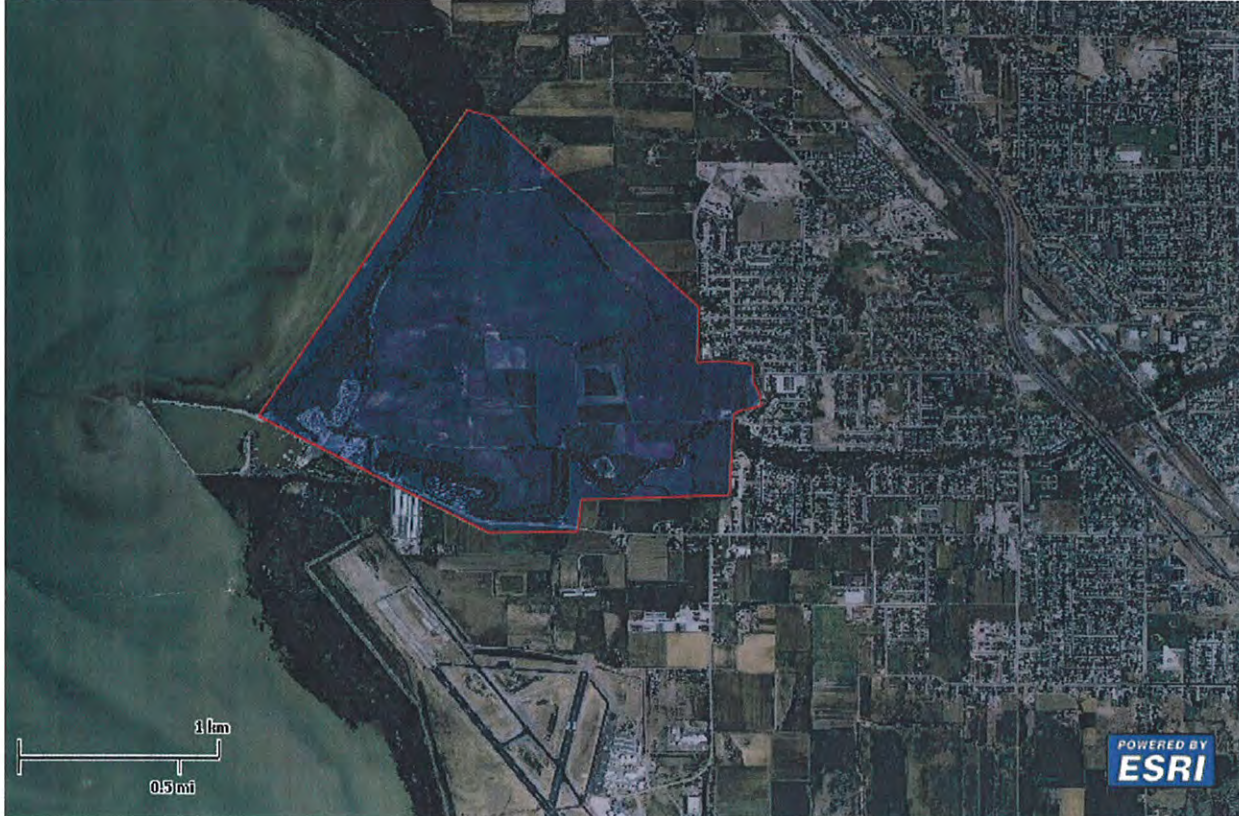
Provo River Delta Restoration Project



U.S. Fish and Wildlife Service

Natural Resources of Concern

Project Location Map:



Project Counties:

Utah, UT

Geographic coordinates (Open Geospatial Consortium Well-Known Text, NAD83):

MULTIPOLYGON (((-111.72724 40.25665, -111.72578 40.2563, -111.71367 40.24609, -111.71376 40.24309, -111.71222 40.24317, -111.7105 40.243, -111.71041 40.24197, -111.71007 40.24137, -111.70998 40.24077, -111.71119 40.24051, -111.71161 40.24034, -111.71187 40.23596, -111.72054 40.23571, -111.7208 40.23399, -111.72595 40.2339, -111.73951 40.24017, -111.72724 40.25665)))

Project Type:

Land - Restoration / Enhancement



U.S. Fish and Wildlife Service

Natural Resources of Concern

Endangered Species Act Species-list

There are a total of 6 species in your species-list

Species that may be affected by your project: ([View all critical habitat on one map](#))

Birds				
Greater sage-grouse (<i>Centrocercus urophasianus</i>) Population: entire	Candidate	species info		Utah Ecological Services Field Office
Yellow-Billed Cuckoo (<i>Coccyzus americanus</i>) Population: Western U.S. DPS	Candidate	species info		Utah Ecological Services Field Office
Fishes				
June sucker (<i>Chasmistes liorus</i>)	Endangered	species info	Final designated critical habitat	Utah Ecological Services Field Office
Least chub (<i>Iotichthys phlegethontis</i>)	Candidate	species info		Utah Ecological Services Field Office
Flowering Plants				
Ute ladies'-tresses (<i>Spiranthes diluvialis</i>)	Threatened	species info		Utah Ecological Services Field Office
Mammals				
Canada Lynx (<i>Lynx canadensis</i>) Population: (Contiguous U.S. DPS)	Threatened	species info		Utah Ecological Services Field Office

FWS National Wildlife Refuges

There are no refuges found within the vicinity of your project.



U.S. Fish and Wildlife Service

Natural Resources of Concern

FWS Migratory Birds

Not yet available through IPaC.

FWS Delineated Wetlands

Not yet available through IPaC.



State of Utah

DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
Executive Director

Utah Geological Survey

RICHARD G. ALLIS
State Geologist Division Director

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CLASSIFICATION _____
PROJECT _____
FOLDER _____ CONTROL _____

MAY 16 2011

May 11, 2011

CODE	INITIALS
MC65	RM
MC02	MAA

Richard Mingo
Utah Reclamation Mitigation and Conservation Commission
230 South 500 East, Suite 230
Salt Lake City UT 84102

RE: Paleontological Field Search and Recommendations for the Provo River Delta
Restoration Project, Utah County, Utah
U.C.A. 79-3-508 (Paleontological) Compliance; Request for Confirmation of Literature
Search according to the UDOT/UGS Memorandum of Understanding.

Dear Richard:

I have conducted a paleontological file search for the Provo River Delta Restoration Project in response to a request from Sean Keenan of BIO-WEST, Inc on May 10, 2011.

There are no paleontological localities recorded in our filed for this project area. Quaternary and Recent surficial deposits exposed throughout this project are have a low potential for yielding significant fossil localities (PFYC Class 1 – 2). Unless fossils are discovered as a result of construction activities, this project should have no impact on paleontological resources.

If you have any questions, please call me at (801) 537-3311.

Sincerely,

Martha Hayden
Paleontological Assistant

CC: Sean Keenan, BIO-WEST, Inc.



UTAH RECLAMATION
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AND CONSERVATION
COMMISSION

230 South 500 East Suite 230 Salt Lake City, UT 84102-2045
Phone: (801) 524-3146 – Fax: (801) 524-3148

COMMISSIONERS
Jody L. Williams, Chair
Don A. Christiansen
Brad T. Barber
Dallin W. Jensen
James Karpowitz

May 16, 2011

Amos Murphy, Acting Chairman
Goshute Indian Tribe
P.O. Box 6104
Ibapah, Utah 84034

MITIGATION COMMISSION	
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CODE	INITIALS
MCA1	MCA
CLASSIFICATION #	ENV-6.00
PROJECT #	PRDRP 3748
FOLDER #	1139682
CONTROL #	

Subject: Provo River Delta Restoration Project, Utah County, Utah

Honorable Chairman Murphy:

A Notice of Intent to prepare an Environmental Impact Statement has been issued for the Provo River Delta Restoration Project (PRDRP). In accordance with §800.2(a)(4) of the National Historic Preservation Act we are inviting you to participate in consultations regarding religious or culturally significant properties that may be affected by this undertaking.

The PRDRP is being proposed by the Department of the Interior Central Utah Project Completion Act Office, the Utah Reclamation Mitigation and Conservation Commission and the Central Utah Water Conservancy District, collectively referred to as the Joint Lead Agencies (JLA's). The project is located in Utah County, Utah at the mouth of the Provo River and Utah Lake. The PRDRP is being proposed to facilitate the recovery of June sucker (*Chasmistes liorus*), an endemic fish of Utah Lake which was listed as an Endangered Species in 1986. Under the Proposed Action, the JLA's would realign the Provo River into a new river channel approximately two miles upstream of the confluence with Utah Lake. The realigned Provo River channel would flow into a restored delta ecosystem that would provide the habitat conditions necessary for June sucker to develop to a size that can survive in Utah Lake. This habitat is presently lacking as a result of flow and habitat alterations that have taken place in the historic Provo River delta. Enclosed is a Public Scoping Meeting Handout that provides more information on the project.

If you wish to consult with the JLA's regarding this project, please contact Mr. Mark Holden at (801) 524-3146.

Sincerely,



Michael C. Weland
Executive Director

Enclosure

UTAH RECLAMATION
MITIGATION
AND CONSERVATION
COMMISSION

230 South 500 East Suite 230 Salt Lake City, UT 84102-2045
Phone: (801) 524-3146 – Fax: (801) 524-3148

COMMISSIONERS
Jody L. Williams, Chair
Don A. Christiansen
Brad T. Barber
Dallin W. Jensen
James Karpowitz

May 16, 2011

Gwen Davis, Chairwoman
Northwestern Band of Shoshone Nation
707 North Main Street
Brigham City, Utah 84302

MITIGATION COMMISSION	
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CODE	INITIALS
MC01	MCW
CLASSIFICATION #	
PROJECT #	
FOLDER #	
CONTROL #	

Subject: Provo River Delta Restoration Project, Utah County, Utah

Honorable Chairwoman Davis:

A Notice of Intent to prepare an Environmental Impact Statement has been issued for the Provo River Delta Restoration Project (PRDRP). In accordance with §800.2(a)(4) of the National Historic Preservation Act we are inviting you to participate in consultations regarding religious or culturally significant properties that may be affected by this undertaking.

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If you wish to consult with the JLA's regarding this project, please contact Mr. Mark Holden at (801) 524-3146.

Sincerely,



Michael C. Weland
Executive Director

Enclosure

UTAH RECLAMATION
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230 South 500 East Suite 230 Salt Lake City, UT 84102-2045
Phone: (801) 524-3146 – Fax: (801) 524-3148

COMMISSIONERS
Jody L. Williams, Chair
Don A. Christiansen
Brad T. Barber
Dallin W. Jensen
James Karpowitz

May 16, 2011

Lori Bear Skiby, Chairwoman
Skull Valley Band of Goshute Indians
P.O. Box 448
Grantsville, Utah 84029

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CODE	INITIALS
MDI	MCW
CLASSIFICATION #	
PROJECT #	
FOLDER #	
CONTROL #	

Subject: Provo River Delta Restoration Project, Utah County, Utah

Honorable Chairwoman Skiby:

A Notice of Intent to prepare an Environmental Impact Statement has been issued for the Provo River Delta Restoration Project (PRDRP). In accordance with §800.2(a)(4) of the National Historic Preservation Act we are inviting you to participate in consultations regarding religious or culturally significant properties that may be affected by this undertaking.

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If you wish to consult with the JLA's regarding this project, please contact Mr. Mark Holden at (801) 524-3146.

Sincerely,



Michael C. Weland
Executive Director

Enclosure

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Jody L. Williams, Chair
Don A. Christiansen
Brad T. Barber
Dallin W. Jensen
James Karpowitz

May 16, 2011

Richard Jenks Jr., Chairman
Ute Indian Tribe
P.O. Box 190
Fort Duchesne, Utah 84026-0190

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MC01	mcw
CLASSIFICATION #	
PROJECT #	
FOLDER #	
CONTROL #	

Subject: Provo River Delta Restoration Project, Utah County, Utah

Honorable Chairman Jenks:

A Notice of Intent to prepare an Environmental Impact Statement has been issued for the Provo River Delta Restoration Project (PRDRP). In accordance with §800.2(a)(4) of the National Historic Preservation Act we are inviting you to participate in consultations regarding religious or culturally significant properties that may be affected by this undertaking.

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If you wish to consult with the JLA's regarding this project, please contact Mr. Mark Holden at (801) 524-3146.

Sincerely,



Michael C. Weland
Executive Director

Enclosure



State of Utah

GARY R. HERBERT
Governor

GREG BELL
Lieutenant Governor

Office of the Governor
PUBLIC LANDS POLICY COORDINATION

Kathleen Clarke
Director

February 21, 2012

Richard Mingo
Utah Reclamation Mitigation & Conservation Commission
230 South 500 East
Suite 230
Salt Lake City, Utah 84102

Subject: PLPCO consulting party status for the Provo River Delta Restoration Project

Dear Mr. Mingo:

The Utah Governor's Public Lands Policy Coordination Office (PLPCO) coordinates the state's interests on public land issues and acts to ensure that state and local interests are considered in the management of public lands. As provided in Utah Annotated Code, PLPCO works to ensure that surveys and excavations of the state's archaeological and anthropological resources are undertaken in a coordinated, professional, and organized manner, through administration of the state archaeological survey and excavation permitting system (Utah Code Ann. § 9-8-305). PLPCO also conducts mediation (joint analysis) between the state historic preservation officer and other state agencies when parties do not agree with effects on historic properties (Utah Code Ann. § 9-8-404). Consistent with other statutory duties, PLPCO also encourages agencies to responsibly preserve archaeological resources (Utah Code Ann. § 63J-4-603[1][g]).

Given PLPCO's mission and responsibilities listed above, the agency would like to request consulting party status pursuant to 36 CFR § 800.2(c)(5) of the Advisory Council on Historic Preservation's regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. Section 470f), for the Provo River Delta Restoration Project. Should the Commission need additional information to consider PLPCO's suitability for consulting party status, please feel free to contact me.

Sincerely,

Dr. David T. Yoder
Public Lands Policy Coordination Office
5110 State Office Building
P.O. Box 141107
Salt Lake City, Utah 84114-1107
davidyoder@utah.gov
(801) 537-9014

Subject: FW: Tuesday Meetings

From: "Mingo, Richard G" <RMingo@usbr.gov>

Date: 2/28/2012 2:49 PM

To: Sarah Sutherland <Sarah@cuwcd.com>, "Baxter, Lee" <LBaxter@usbr.gov>, "Ken Sim" <ksim@bio-west.com>, "Darren Olsen" <darrenolsen@gmail.com>, Sean Keenan <skeenan@bio-west.com>, "Holden, Mark A" <MHolden@usbr.gov>

CC: "Mingo, Richard G" <RMingo@usbr.gov>

FYI – Following is the message from David Yoder with regs on Consulting Parties and their request to be a consulting party.

From: David Yoder [mailto:DavidYoder@utah.gov]

Sent: Tuesday, February 21, 2012 2:27 PM

To: Mingo, Richard G

Subject: Re: Tuesday Meetings

Richard,

I've attached the Section 106 regs. I highlighted some of the consulting party info that you may be interested in.

I think the only two groups who may want to be consulting parties are the ones we discussed at the meeting--Utah Professional Archaeological Council (UPAC) and the Utah Statewide Archaeological Survey (USAS). UPAC's president is Jim Allison (jallison@byu.edu), and he would be your primary contact for that organization (or at least the place to send info to begin with, after which he may delegate it to someone else on the executive committee). I believe USAS's current president is Bruce Burgess (bnbfamily@yahoo.com), but I'm not entirely sure (as they have often change in leadership). I would recommend contacting Bruce, but also contacting Ren Thomas (thomas2014_1@msn.com), as I believe he is in the leadership for the Provo Chapter of USAS, which is the chapter you would be working with.

I've also attached PLPCO's official request for consulting party status.

Thanks for organizing the meeting today; and feel free to contact me if you have any questions or if I can help.

David

David T. Yoder

Archaeologist

Governor's Public Lands Policy Coordination Office

davidyoder@utah.gov

801-537-9014 (Office)

>>> "Mingo, Richard G" <RMingo@usbr.gov> 2/17/2012 1:10 PM >>>

All – Attached is a rough agenda for our meetings on Tuesday. My apologies for making this so confusing, but we wanted to take advantage of the opportunity to meet with SHPO on both the PRDRP and the LDWP. In the morning will coordinate with SHPO on both projects. In the afternoon we will discuss construction implementation on LDWP for this upcoming spring/summer. You need only attend at the times as appropriate for you.

Agenda

Provo River Delta Restoration Project

Lower Duchesne River Wetlands Mitigation Project

Tuesday February 21, 2012

10:00 **Provo River Delta Restoration Project**

Background
Status
Section 106 Compliance

11:00 **Lower Duchesne River Wetlands Mitigation Project**

Background
Status
Section 106 Compliance

Noon **break for lunch**

1:00 **Lower Duchesne River Wetlands Mitigation Project**

2012 Construction Implementation Scheduling

Richard Mingo
Utah Reclamation Mitigation & Conservation Commission
230 South 500 East | Suite 230 | Salt Lake City | UT 84102
p. 801.524.3168 | c. 801.884.6130 | rmingo@usbr.gov

— Attachments: —

36 CFR Part 800.pdf	155 KB
PLPCO Consulting Party Status Request.docx	160 KB

UTAH RECLAMATION
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230 South 500 East Suite 230 Salt Lake City, UT 84102-2045
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Dallin W. Jensen
James Karpowitz

March 22, 2012

Mr. David Yoder
Archeological Permitting Analyst
Public Lands Policy Coordination Office
5110 State Office Building
P.O. Box 141107
Salt Lake City, Utah 84114-1107

Subject: Provo River Delta Restoration Project, Utah County, Utah

Dear Mr. Yoder:

We received your letter dated February 21, 2012 requesting status as a consulting party pursuant to 36 CFR § 800.2(c)(5) of the Advisory Council on Historic Preservation's regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. Section 470f). We approve your request and will discuss with you further how to formalize this agreement. We have also invited the Utah Professional Archaeological Council (UPAC) and the Utah Statewide Archaeological Survey (USAS) to participate as consulting parties as you have suggested.

More information regarding the project can be found on the project's website at www.provoriverdelta.us.

Sincerely,



Michael C. Weland
Executive Director

cc: Lori Hunsaker, Utah Division of State History
James R. Allison, Brigham Young University
Bruce Burgess, Utah Statewide Archaeological Society
Ren Thomas, Utah Statewide Archaeological Society
Lee Baxter, DOI
Ms. Sarah Sutherland, CUWCD
Darren Olsen, Bio-West

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James Karpowitz

March 26, 2012

Ms. Lori Hunsaker
Utah Division of State History
300 Rio Grande
Salt Lake City, UT 84101-1182

Subject: Provo River Delta Restoration Project, Utah County, Utah

Dear Ms. Hunsaker:

It was a pleasure to meet with you on February 21, 2012, to informally introduce and discuss the Provo River Delta Restoration Project (PRDRP). The PRDRP is needed to facilitate recovery of June sucker, a species endemic to Utah Lake, and listed as endangered pursuant to the Endangered Species Act. The proposed project would realign to lower portion of the Provo River and its interface with Utah Lake to restore the habitat necessary for juvenile June sucker to develop to an adult stage.

We are requesting to formally initiate our coordination and consultation responsibilities with your office pursuant to Section 106 of the National Historic Preservation Act. By copy of this letter, we are also inviting consulting parties to participate in the Section 106 process pursuant to 36 CFR § 800.2(c)(5) of the Advisory Council on Historic Preservation's regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. Section 470f).

If you wish to participate as a consulting party or have any other questions, please contact Richard Mingo at 524-3168.

Sincerely,



Michael C. Weland
Executive Director

cc: David Yoder, Public Lands Policy Coordination Office
James R. Allison, Brigham Young University
Bruce Burgess, Utah Statewide Archaeological Society
Ren Thomas, Utah Statewide Archaeological Society
Lee Baxter, DOI
Sarah Sutherland, CUWCD
Darren Olsen, Bio-West



Utah Statewide Archaeological Society Utah County Chapter

Richard Mingo
Utah Reclamation Mitigation
& Conservation Commission
230 South 500 East, Suite 230
Salt Lake City, UT 84102-2045

March 27, 2012

Dear Mr. Mingo:

The Utah Statewide Archaeological Society (USAS) is a nonprofit citizens group of volunteers that advocate for the protection, preservation and educational presentation of the State's archaeological resources for the public. We are closely affiliated with the Utah Division of State History and the Utah Professional Archaeological Counsel (UPAC). Thank you for this opportunity to express our concerns and be considered and contacted as a consulting party in regard to the cultural and archaeological resources involved in the area of the Provo River Delta Restoration Project.

The following is the contact information for contacting the Utah County Chapter of the Utah Statewide Archaeological Society (USAS). Thank You again for your consideration.

Ren Thomas
USAS, Utah County Chapter

USAS, Utah County Chapter c/o

Ren Thomas
449 South 100 East
Nephi, Utah 84648
(435) 623-2014 thomas2014_1@msn.com

Toni Wall
2105 E Powerhouse Rd.
Spanish Fork, UT 84660
(801) 798-2085 WallTK@aol.com

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August 20, 2013

Mr. John McMullin
Utah County
2855 South State Street
Provo, UT 84606

Subject: Cooperating Agency Meeting, Provo River Delta Restoration Project
Environmental Impact Statement; September 12, 2013

Dear Mr. McMullin:

We are writing to invite your attendance at a Cooperating Agency meeting sponsored by the three Joint-Lead Agencies preparing the environmental impact statement (EIS) for the proposed Provo River Delta Restoration Project. The three Joint Lead Agencies responsible for preparing the EIS and for making subsequent decisions regarding the proposed project are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Department of the Interior – Central Utah Project Completion Act Office (Interior) and Central Utah Water Conservancy District (Central Utah). The main purposes for the meeting are to provide an update to the Cooperating Agencies, and to distribute the Cooperating Agency Internal Review Draft of the EIS. The meeting will be held on September 12, 2013 at 1:30 p.m. at Central Utah's office located at 355 West University Parkway, Orem, Utah.

If there is a need by any of the Cooperating Agencies, we will make the meeting available via WebEx. If you have any questions or comments please contact Mr. Richard Mingo at 801/524-3168 or at rmingo@usbr.gov.

On behalf of the Joint-Lead Agencies, we appreciate your interest in the proposed Provo River Delta Restoration Project.

Sincerely,



A handwritten signature in cursive script that reads "Michael C. Weland".

Michael C. Weland
Executive Director

cc: Reed Murray, U.S. Department of the Interior
Gene Shawcroft, Central Utah Water Conservancy District
Michael Mills, Central Utah Water Conservancy District - JSRIP

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Dallin W. Jensen

August 20, 2013

Mayor John Curtis
Provo City
351 West Center Street
Provo, UT 84601

Subject: Cooperating Agency Meeting, Provo River Delta Restoration Project
Environmental Impact Statement; September 12, 2013

Dear Mayor Curtis:

We are writing to invite your attendance at a Cooperating Agency meeting sponsored by the three Joint-Lead Agencies preparing the environmental impact statement (EIS) for the proposed Provo River Delta Restoration Project. The three Joint Lead Agencies responsible for preparing the EIS and for making subsequent decisions regarding the proposed project are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Department of the Interior – Central Utah Project Completion Act Office (Interior) and Central Utah Water Conservancy District (Central Utah). The main purposes for the meeting are to provide an update to the Cooperating Agencies, and to distribute the Cooperating Agency Internal Review Draft of the EIS. The meeting will be held on September 12, 2013 at 1:30 p.m. at Central Utah's office located at 355 West University Parkway, Orem, Utah.

If there is a need by any of the Cooperating Agencies, we will make the meeting available via WebEx. If you have any questions or comments please contact Mr. Richard Mingo at 801/524-3168 or at rmingo@usbr.gov.

On behalf of the Joint-Lead Agencies, we appreciate your interest in the proposed Provo River Delta Restoration Project.

Sincerely,



Michael C. Weland
Executive Director

cc: Reed Murray, U.S. Department of the Interior
Gene Shawcroft, Central Utah Water Conservancy District
Michael Mills, Central Utah Water Conservancy District



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August 20, 2013

Mr. Henry Maddux
Utah Dept. of Natural Resources
1594 West North Temple, Suite 3710
Salt Lake City, UT 84114-5610

Subject: Cooperating Agency Meeting, Provo River Delta Restoration Project
Environmental Impact Statement; September 12, 2013


Dear Mr. Maddux:

We are writing to invite your attendance at a Cooperating Agency meeting sponsored by the three Joint-Lead Agencies preparing the environmental impact statement (EIS) for the proposed Provo River Delta Restoration Project. The three Joint Lead Agencies responsible for preparing the EIS and for making subsequent decisions regarding the proposed project are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Department of the Interior – Central Utah Project Completion Act Office (Interior) and Central Utah Water Conservancy District (Central Utah). The main purposes for the meeting are to provide an update to the Cooperating Agencies, and to distribute the Cooperating Agency Internal Review Draft of the EIS. The meeting will be held on September 12, 2013 at 1:30 p.m. at Central Utah's office located at 355 West University Parkway, Orem, Utah.

If there is a need by any of the Cooperating Agencies, we will make the meeting available via WebEx. If you have any questions or comments please contact Mr. Richard Mingo at 801/524-3168 or at rmingo@usbr.gov.

On behalf of the Joint-Lead Agencies, we appreciate your interest in the proposed Provo River Delta Restoration Project.

Sincerely,



Michael C. Weland
Executive Director

cc: Reed Murray, U.S. Department of the Interior
Gene Shawcroft, Central Utah Water Conservancy District
Michael Mills, Central Utah Water Conservancy District - JSRIP



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August 20, 2013

Mr. Curtis Pledger
Area Manager
U.S. Bureau of Reclamation
302 East 1860 South
Provo, UT 84606-7317

Subject: Cooperating Agency Meeting, Provo River Delta Restoration Project
Environmental Impact Statement; September 12, 2013

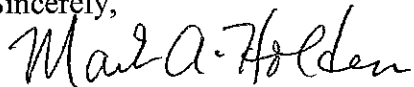
Dear Mr. Pledger:

We are writing to invite your attendance at a Cooperating Agency meeting sponsored by the three Joint-Lead Agencies preparing the environmental impact statement (EIS) for the proposed Provo River Delta Restoration Project. The three Joint Lead Agencies responsible for preparing the EIS and for making subsequent decisions regarding the proposed project are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Department of the Interior – Central Utah Project Completion Act Office (Interior) and Central Utah Water Conservancy District (Central Utah). The main purposes for the meeting are to provide an update to the Cooperating Agencies, and to distribute the Cooperating Agency Internal Review Draft of the EIS. The meeting will be held on September 12, 2013 at 1:30 p.m. at Central Utah's office located at 355 West University Parkway, Orem, Utah.

If there is a need by any of the Cooperating Agencies, we will make the meeting available via WebEx. If you have any questions or comments please contact Mr. Richard Mingo at 801/524-3168 or at rmingo@usbr.gov.

On behalf of the Joint-Lead Agencies, we appreciate your interest in the proposed Provo River Delta Restoration Project.

Sincerely,



Michael C. Weland
Executive Director

cc: Reed Murray, U.S. Department of the Interior
Gene Shawcroft, Central Utah Water Conservancy District
Michael Mills, Central Utah Water Conservancy District - JSRIP



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August 20, 2013

Mr. Jason Gipson
Chief, Utah Regulatory Office
U.S. Army Corps of Engineers
533 West 2600 South, Suite 150
Bountiful, Utah 84010

Subject: Cooperating Agency Meeting, Provo River Delta Restoration Project
Environmental Impact Statement; September 12, 2013

Dear Mr. Gipson:

We are writing to invite your attendance at a Cooperating Agency meeting sponsored by the three Joint-Lead Agencies preparing the environmental impact statement (EIS) for the proposed Provo River Delta Restoration Project. The three Joint Lead Agencies responsible for preparing the EIS and for making subsequent decisions regarding the proposed project are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Department of the Interior – Central Utah Project Completion Act Office (Interior) and Central Utah Water Conservancy District (Central Utah). The main purposes for the meeting are to provide an update to the Cooperating Agencies, and to distribute the Cooperating Agency Internal Review Draft of the EIS. The meeting will be held on September 12, 2013 at 1:30 p.m. at Central Utah's office located at 355 West University Parkway, Orem, Utah.

If there is a need by any of the Cooperating Agencies, we will make the meeting available via WebEx. If you have any questions or comments please contact Mr. Richard Mingo at 801/524-3168 or at rmingo@usbr.gov.

On behalf of the Joint-Lead Agencies, we appreciate your interest in the proposed Provo River Delta Restoration Project.



Sincerely,

A handwritten signature in black ink that reads "Michael C. Weland". The signature is written in a cursive style with a large, stylized "M" and "W".

Michael C. Weland
Executive Director

cc: Reed Murray, U.S. Department of the Interior
Gene Shawcroft, Central Utah Water Conservancy District
Michael Mills, Central Utah Water Conservancy District - JSRIP

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August 20, 2013

Ms. Kristin Hartman Brownson, P.E.
Utah State Engineer
FAA Denver Airports District Office
26805 E. 68TH Ave., Suite 224
Denver, CO 80249

Subject: Cooperating Agency Meeting, Provo River Delta Restoration Project
Environmental Impact Statement; September 12, 2013

Dear Ms. Hartman Brownson:

We are writing to invite your attendance at a Cooperating Agency meeting sponsored by the three Joint-Lead Agencies preparing the environmental impact statement (EIS) for the proposed Provo River Delta Restoration Project. The three Joint Lead Agencies responsible for preparing the EIS and for making subsequent decisions regarding the proposed project are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Department of the Interior – Central Utah Project Completion Act Office (Interior) and Central Utah Water Conservancy District (Central Utah). The main purposes for the meeting are to provide an update to the Cooperating Agencies, and to distribute the Cooperating Agency Internal Review Draft of the EIS. The meeting will be held on September 12, 2013 at 1:30 p.m. at Central Utah's office located at 355 West University Parkway, Orem, Utah.

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On behalf of the Joint-Lead Agencies, we appreciate your interest in the proposed Provo River Delta Restoration Project.

Sincerely,



Michael C. Weland
Executive Director



cc: Reed Murray, U.S. Department of the Interior
Gene Shawcroft, Central Utah Water Conservancy District
Michael Mills, Central Utah Water Conservancy District - JSRIP

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August 20, 2013

Ms. Janell Barrilleaux
Environmental Program Manager
Federal Aviation Administration
Northwest Mountain Region
1601 Lind Ave. SW, Suite 315
Renton, WA 98057-3356

Subject: Cooperating Agency Meeting, Provo River Delta Restoration Project
Environmental Impact Statement; September 12, 2013

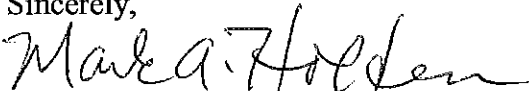
Dear Ms. Barrilleaux

We are writing to invite your attendance at a Cooperating Agency meeting sponsored by the three Joint-Lead Agencies preparing the environmental impact statement (EIS) for the proposed Provo River Delta Restoration Project. The three Joint Lead Agencies responsible for preparing the EIS and for making subsequent decisions regarding the proposed project are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Department of the Interior – Central Utah Project Completion Act Office (Interior) and Central Utah Water Conservancy District (Central Utah). The main purposes for the meeting are to provide an update to the Cooperating Agencies, and to distribute the Cooperating Agency Internal Review Draft of the EIS. The meeting will be held on September 12, 2013 at 1:30 p.m. at Central Utah's office located at 355 West University Parkway, Orem, Utah.

If there is a need by any of the Cooperating Agencies, we will make the meeting available via WebEx. If you have any questions or comments please contact Mr. Richard Mingo at 801/524-3168 or at rmingo@usbr.gov.

On behalf of the Joint-Lead Agencies, we appreciate your interest in the proposed Provo River Delta Restoration Project.

Sincerely,



ACTING
FOR Michael C. Weland
Executive Director

cc: Reed Murray, U.S. Department of the Interior
Gene Shawcroft, Central Utah Water Conservancy District
Michael Mills, Central Utah Water Conservancy District - JSRIP

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August 20, 2013

Mr. Larry Crist
Field Supervisor
U.S. Fish & Wildlife Service
2369 West Orton Circle, Suite 50
West Valley City, UT 84119

Subject: Cooperating Agency Meeting, Provo River Delta Restoration Project
Environmental Impact Statement; September 12, 2013

Dear Mr. Crist:

We are writing to invite your attendance at a Cooperating Agency meeting sponsored by the three Joint-Lead Agencies preparing the environmental impact statement (EIS) for the proposed Provo River Delta Restoration Project. The three Joint Lead Agencies responsible for preparing the EIS and for making subsequent decisions regarding the proposed project are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Department of the Interior – Central Utah Project Completion Act Office (Interior) and Central Utah Water Conservancy District (Central Utah). The main purposes for the meeting are to provide an update to the Cooperating Agencies, and to distribute the Cooperating Agency Internal Review Draft of the EIS. The meeting will be held on September 12, 2013 at 1:30 p.m. at Central Utah's office located at 355 West University Parkway, Orem, Utah.

If there is a need by any of the Cooperating Agencies, we will make the meeting available via WebEx. If you have any questions or comments please contact Mr. Richard Mingo at 801/524-3168 or at rmingo@usbr.gov.

On behalf of the Joint-Lead Agencies, we appreciate your interest in the proposed Provo River Delta Restoration Project.



Sincerely,

A handwritten signature in cursive script that reads "Michael C. Weland".

Michael C. Weland
Executive Director

cc: Reed Murray, U.S. Department of the Interior
Gene Shawcroft, Central Utah Water Conservancy District
Michael Mills, Central Utah Water Conservancy District - JSRIP

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Dallin W. Jensen

August 20, 2013

Commissioner Gary Anderson, Chair
Utah County Commission
100 E Center Street, Suite 2300
Provo, Utah 84606

Subject: Cooperating Agency Meeting, Provo River Delta Restoration Project
Environmental Impact Statement; September 12, 2013

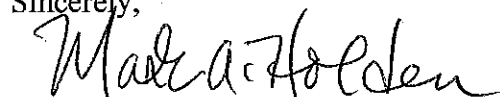
Dear Mr. Anderson:

We are writing to invite your attendance at a Cooperating Agency meeting sponsored by the three Joint-Lead Agencies preparing the environmental impact statement (EIS) for the proposed Provo River Delta Restoration Project. The three Joint Lead Agencies responsible for preparing the EIS and for making subsequent decisions regarding the proposed project are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Department of the Interior – Central Utah Project Completion Act Office (Interior) and Central Utah Water Conservancy District (Central Utah). The main purposes for the meeting are to provide an update to the Cooperating Agencies, and to distribute the Cooperating Agency Internal Review Draft of the EIS. The meeting will be held on September 12, 2013 at 1:30 p.m. at Central Utah's office located at 355 West University Parkway, Orem, Utah.

If there is a need by any of the Cooperating Agencies, we will make the meeting available via WebEx. If you have any questions or comments please contact Mr. Richard Mingo at 801/524-3168 or at rmingo@usbr.gov.

On behalf of the Joint-Lead Agencies, we appreciate your interest in the proposed Provo River Delta Restoration Project.

Sincerely,



Michael C. Weland
Executive Director



cc: Reed Murray, U.S. Department of the Interior
Gene Shawcroft, Central Utah Water Conservancy District
Michael Mills, Central Utah Water Conservancy District - JSRIP

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Dallin W. Jensen

August 20, 2013

Mr. Dick Buehler
Utah Division of Forestry Fire and State Lands
1594 West North Temple, Suite 3710
Salt Lake City, Utah 84116

Subject: Cooperating Agency Meeting, Provo River Delta Restoration Project
Environmental Impact Statement; September 12, 2013

Dear Mr. Buehler:

We are writing to invite your attendance at a Cooperating Agency meeting sponsored by the three Joint-Lead Agencies preparing the environmental impact statement (EIS) for the proposed Provo River Delta Restoration Project. The three Joint Lead Agencies responsible for preparing the EIS and for making subsequent decisions regarding the proposed project are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Department of the Interior – Central Utah Project Completion Act Office (Interior) and Central Utah Water Conservancy District (Central Utah). The main purposes for the meeting are to provide an update to the Cooperating Agencies, and to distribute the Cooperating Agency Internal Review Draft of the EIS. The meeting will be held on September 12, 2013 at 1:30 p.m. at Central Utah's office located at 355 West University Parkway, Orem, Utah.

If there is a need by any of the Cooperating Agencies, we will make the meeting available via WebEx. If you have any questions or comments please contact Mr. Richard Mingo at 801/524-3168 or at rmingo@usbr.gov.

On behalf of the Joint-Lead Agencies, we appreciate your interest in the proposed Provo River Delta Restoration Project.

Sincerely,



Michael C. Weland
Executive Director

cc: Reed Murray, U.S. Department of the Interior
Gene Shawcroft, Central Utah Water Conservancy District
Michael Mills, Central Utah Water Conservancy District - JSRIP



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Brad T. Barber
Dallin W. Jensen

August 20, 2013

Mr. Fred Hayes, Director
Utah Division of Parks and Recreation
1594 West North Temple, Suite 3710
Salt Lake City, Utah 84116

Subject: Cooperating Agency Meeting, Provo River Delta Restoration Project
Environmental Impact Statement; September 12, 2013

Dear Mr. Hayes:

We are writing to invite your attendance at a Cooperating Agency meeting sponsored by the three Joint-Lead Agencies preparing the environmental impact statement (EIS) for the proposed Provo River Delta Restoration Project. The three Joint Lead Agencies responsible for preparing the EIS and for making subsequent decisions regarding the proposed project are the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission), the Department of the Interior – Central Utah Project Completion Act Office (Interior) and Central Utah Water Conservancy District (Central Utah). The main purposes for the meeting are to provide an update to the Cooperating Agencies, and to distribute the Cooperating Agency Internal Review Draft of the EIS. The meeting will be held on September 12, 2013 at 1:30 p.m. at Central Utah's office located at 355 West University Parkway, Orem, Utah.

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On behalf of the Joint-Lead Agencies, we appreciate your interest in the proposed Provo River Delta Restoration Project.

Sincerely,



Michael C. Weland
Michael C. Weland
Executive Director

cc: Reed Murray, U.S. Department of the Interior
Gene Shawcroft, Central Utah Water Conservancy District
Michael Mills, Central Utah Water Conservancy District - JSRIP



Utah Statewide Archaeological Society

Mr. Richard G. Mingo
Utah Reclamation Mitigation & Conservation Commission
230 South 500 East Suite 230
Salt Lake City, Utah 84102
rmingo@usbr.gov

14 January, 2014

Richard,

The purpose of this letter is to inform the parties involved in the Provo River Delta Restoration Project that the Utah Statewide Archaeological society (USAS) is interested in participating as a consulting party to the project. Further USAS concurs with the intent of the Joint Lead Agencies and the Utah Reclamation Mitigation and Conservation Commission to develop a Memorandum of Agreement outlining obligations and commitments in regards to the cultural heritage and resources of the project area prior to any ground disturbing activities.

Thank you and please keep USAS apprised of the projects progress.

Ren Thomas
President, Utah Statewide Archaeological Society
Thomas2014_1@msn.com

Cc: Ms. Lori Hunsaker
Utah Division of State History
300 Rio Grande
Salt Lake City, Utah 84101-1182

Dr. James R. Allison
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GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Julie Fisher
Executive Director
Department of
Heritage & Arts



Brad Westwood
Director

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ME02	ME
ME05	ME

January 30, 2014

Michael C. Weland, Executive Director
Utah Reclamation Mitigation and
Conservation Commission
230 South 500 East, Suite 230
Salt Lake City, UT 84102-2045

RE: Provo River Delta Restoration Project, Utah County, Utah

For future correspondence, please reference Case No. 12-0625

Dear Mr. Weland:

The Utah State Historic Preservation Office received your request for our comment on the above-referenced undertaking on January 14, 2014. The UTSHPO does not believe it is necessary for the Mitigation and Conservation Commission to create an MOA to handle the monitoring for cultural resources during the proposed undertaking's implementation. As there is no determination of adverse effects, an MOA is not appropriate. MOAs are used to resolve adverse effects; and where no historic properties were identified in the APE, there is no determination of adverse effects in this case. Instead, the Commission can simply state that they will adhere to the recommendations described by their contractor, Logan Simpson Design, for this project implementation. In addition, if the Commission feels it is appropriate to develop a formal monitoring plan, as described in LSD's recommendation, then UTSHPO will be happy to review the document. If you would like further clarification on this discussion please feel free to contact us at your convenience.

This letter serves as our comment within the consultation process specified in §36CFR800.4. If you have questions, please contact me at 801-245-7263 or Lori Hunsaker at 801-245-7241 lhunsaker@utah.gov.

Sincerely,

Chris Merritt, Ph.D.
Senior Preservation Specialist
cmerritt@utah.gov